FO-71RA
FO-51RA

SHARP SERVICE MANUAL

No. 00ZFO71RA/SME

Illustration: FO-71RA

FACSIMILE

MODEL FO-71/51

MODEL	SELECTION CODE	DESTINATION
FO-71/51	RA	Russian

Cutter model	Non cutter model
FO-71	FO-51

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Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

CAUTION FOR BATTERY REPLACEMENT

(Danish) ADVARSEL !
Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandoren.

(English) Caution !
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type
recommended by the equipment manufacturer.
Discard used batteries according to manufacturer's
instructions.

(Finnish) VAROITUS
Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden
mukaisesti.

(French) ATTENTION
Il y a danger d'explosion s' il y a remplacement incorrect
de la batterie. Remplacer uniquement avec une batterie du
même type ou d'un type recommandé par le constructeur.
Mettre au rébut les batteries usagées conformément aux
instructions du fabricant.

(Swedish) VARNING
Explosionsfare vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent
typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens
instruktion.

(German) Achtung
Explosionsgefahr bei Verwendung inkorrekter Batterien.
Als Ersatzbatterien dürfen nur Batterien vom gleichen Typ oder
vom Hersteller empfohlene Batterien verwendet werden.
Entsorgung der gebrauchten Batterien nur nach den vom
Hersteller angegebenen Anweisungen.

CHAPTER 1. GENERAL DESCRIPTION

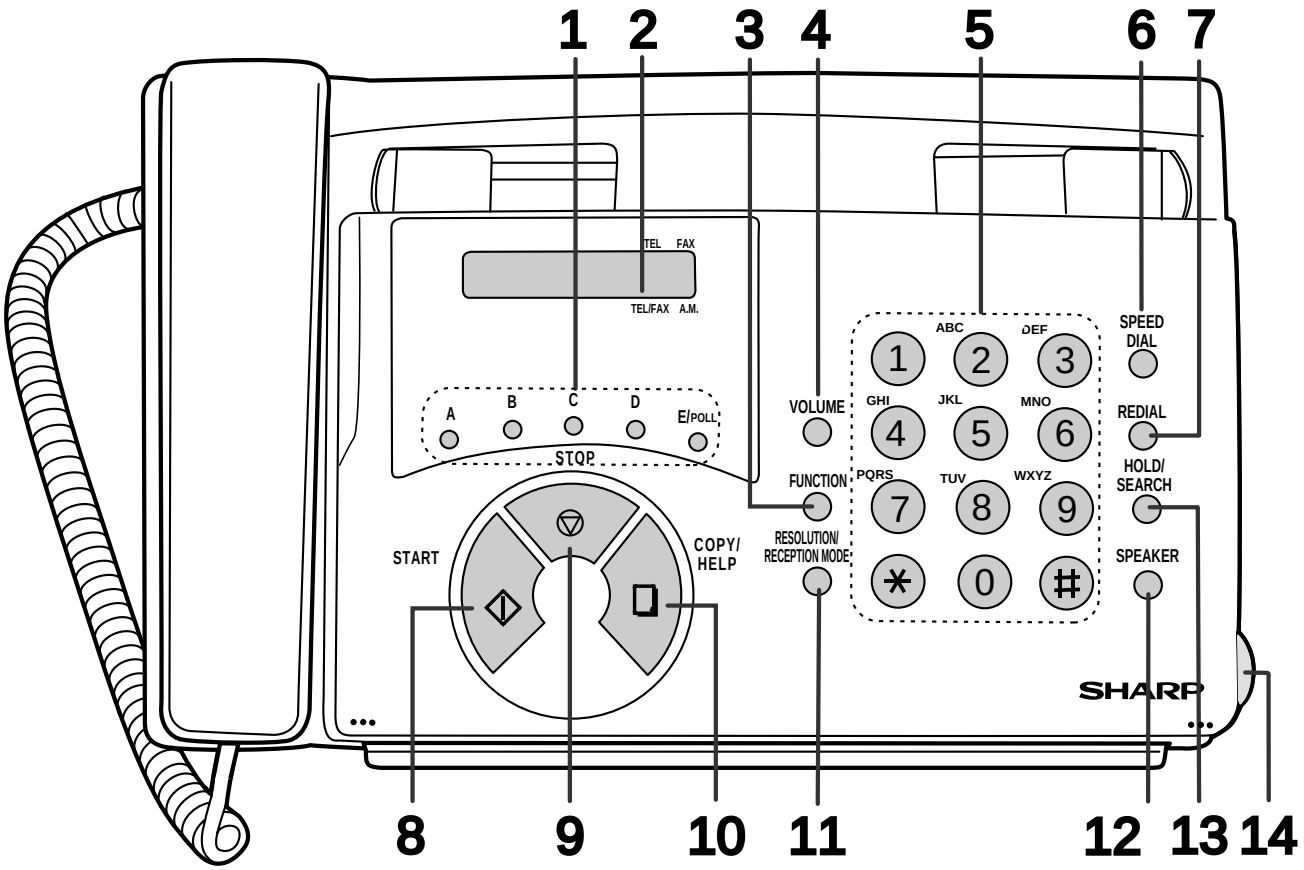
[1] Specifications

Automatic dialing:	Rapid Key Dialing: 5 numbers Speed Dialing: 35 numbers
Fax paper:	Initial starter roll (included with machine): 10 m Recommended replacement roll: FO-20PR 30m (12.7mm core)
Paper cutting method:	**FO-51:** Tear off by hand **FO-71:** Automatic cutter
Memory size*:	448 KB (approx. 17 average pages)
Modem speed:	9,600 bps with automatic fallback to lower speeds
Transmission time*:	Approx. 15 seconds
Resolution:	**Horizontal:** 8 dots/mm **Vertical:** Standard: 3.85 lines/mm Fine/Halftone: 7.7 lines/mm Super fine: 15.4 lines/mm
Automatic document feeder:	5 pages max. (letter/A4, 80 g/m^2 paper)
Recording system:	Thermal recording
Halftone (grayscale):	64 levels
Compression scheme:	MR, MH, H2
Display:	16-digit LCD display
Applicable telephone line:	Public switched telephone network
Compatibility:	ITU-T (CCITT) G3 mode
Input document size:	**Automatic feeding:** Width: 148 to 210 mm Length: 140 to 297 mm **Manual feeding:** Width: 148 to 210 mm Length: 140 to 600 mm
Effective scanning width:	210 mm max.
Effective printing width:	210 mm max.
Contrast control:	Automatic/Dark selectable
Reception modes:	TEL/FAX, TEL, FAX, A.M. (Note: A.M. mode is for connecting an answering machine)
Copy function:	Yes
Telephone function:	Yes (cannot be used if power fails)
Power requirements:	220-240 V AC, 50/60 Hz
Operating temperature:	5 - 35°C
Humidity:	30 - 85 % RH
Power consumption:	Stand-by: 4.0 W Maximum: 115 W
Dimensions:	Width: 304 mm Depth: 236 mm Height: 122 mm
Weight:	Approx. 2.6 kg

* Based on Sharp Standard No.1 Chart at standard resolution is Sharp special mode, excluding time for protocol signals (i.e., ITU-T phase C time only).

As a part of our policy of continuous improvement, SHARP reserves the right to make design and specification changes for procduct improvement without prior notice. The performance specifications figures indicated are nominal values of production units. There may be some deviation from these values in individual units.

[2] Operation panel



1. Rapid Dial keys
Press one of these keys to dial a fax number automatically.

2. Display
This displays messages to help you operate the machine.

3. FUNCTION key
Press this key to select various special functions.

4. VOLUME keys
Press this keys to adjust the volume of the speaker when the **SPEAKER** key has been pressed, the volume of the ringer at all other times.

5. Number keys
Use these keys to dial numbers, and enter numbers and letters when storing auto-dial numbers.

6. SPEED DIAL key
Press this key to dial a fax or voice number using an abbreviated 2-digit Speed Dial number.

7. REDIAL key
Press this key to automatically redial the last number dialed.

8. START key
Press this key to begin transmission when using Speed Dialing, Direct Keypad Dialing, or Normal Dialing.

9. STOP key
Press this key to cancel operation before it is completed.

10. COPY/HELP key
When a document is in the feeder, press this key to make a copy. At any other time, press this key to print out the Help List, a quick reference guide to the operation of your fax machine.

11. RESOLUTION/RECEPTION MODE key
When a document is in the feeder, press this key to adjust the resolution for faxing or copying. At any other time, press this key to select the reception mode (an arrow in the display will point to the currently selected reception mode).

12. SPEAKER key
Press this key to listen to the line and fax tones through the speaker when faxing a document.
Note: **This is not a speakerphone.** You must pick up the handset to talk with the other party.

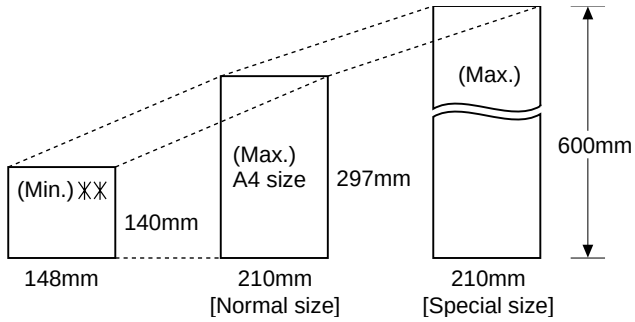
13. HOLD/SEARCH key
Press this key to search for an auto-dial number, or, during a phone conversation, press this key to put the other party on hold.

14. Panel release
Grasp this finger hold and pull toward you to open the operation panel.

[3] Transmittable documents

1. Document Sizes

Normal size	width	148 – 210 mm
	length	140 – 297 mm



※※ Use document carrier sheet for smaller documents.

* With special sizes, only one sheet can be fed into the machine at a time. Insert next page into feeder as current page is being scanned.

2. Paper Thickness & Weight

	4x6 series (788mm x 1091mm x 1000mm sheets)		Square meter series	
	Minimum	Maximum	Minimum	Maximum
Feeder capacity	10 sheets, max.			
Paper weight	45kg	69.2kg	52g/m²	80g/m²
Paper thickness (ref.)	0.06mm	0.09mm	0.06mm	0.09mm
Paper size	148mm x 140mm ~ A4 (210mm x 297mm), Letter (216mm x 279mm)			

3. Document Types

- Normal paper

  Documents handwritten in pencil (No. 2 lead or softer), fountain pen, ball-point pen, or felt-tipped pen can be transmitted.

  Documents of normal contrast duplicated by a copying machine can also be transmitted.
- Diazo copy (blue print)

  Diazo copy documents of a normal contrast may be transmitted.
- Carbon copy

  A carbon copy may be transmitted if its contrast is normal.

4. Cautions on Transmitting Documents

- Documents written in yellow, greenish yellow, or light blue ink cannot be transmitted.
- Ink, glue, and correcting fluid on documents must be dry before the documents can be transmitted.
- All clips, staples and pins must be removed from documents before transmission.
- Patched (taped) documents should be copied first on a copier and then the copies used for transmission.
- All documents should be fanned before insertion into the feeder to prevent possible double feeds.

5. Automatic Document Feeder Capacity

Number of pages that can be placed into the feeder at anytime is as follows:

Normal size: max. ADF 5 sheets

Special size: single sheet only (manual feed)

NOTES:
- When you need to send or copy more pages than the feeder limit, place additional pages in feeder when last page in feeder is being scanned.
- Place additional pages carefully and gently in feeder. If force is used, double-feeding or a document jam may result.

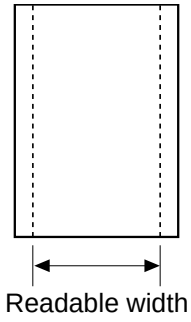
6. Readable Width & Length

The readable width and length of a document are slightly smaller than the actual document size.

Note that characters or graphics outside the effective document scanning range will not be read.

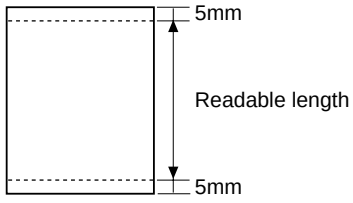
- **Readable width**

210mm, max.



- **Readable length**

This is the length of the document sent minus 5mm from the top and bottom edges.



[4] Installation

1. Site selection

Take the following points into consideration when selecting a site for this model.

ENVIRONMENT

- The machine must be installed on a level surface.
- Keep the machine away from air conditioners, heaters, direct sunlight, and dust.
- Provide easy access to the front, back, and sides of the machine. In particular, keep the area in front of the machine clear, or the original document may jam as it comes out after scanning.
- The temperature should be between 5° and 35°C.
- The humidity should be between 30% and 85% (without condensation).

ELECTRICITY

220-240 V, 50/60 Hz, earthed AC (2-prong) outlet.

Caution!

- Connection to a power source other than that specified will cause damage to the equipment and is not covered under the warranty.
- If your area experiences a high incidence of lightning or power surges, we recommend that you install a surge protector for the power and telephone lines. Surge protectors can be purchased at most telephone specialty stores.

If the machine is moved from a cold to a warm place...

Condensation may from on the reading glass if machine is moved from a cold to a warm place, this will prevent proper scanning of documents for transmission. Turn on the power and wait approximately 2 hours before using machine.

TELEPHONE JACK

A standard telephone jack must be located near the machine.
This is the telephone jack commonly used in most homes and offices.

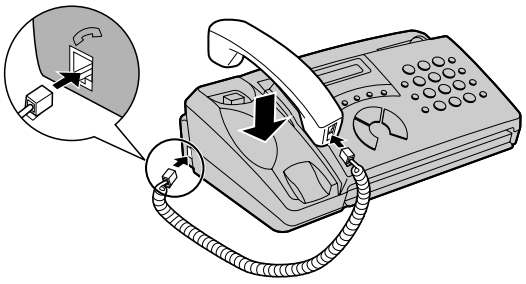
- Plugging the fax machine into a jack which is not an jack may result in damage to the machine or your telephone system. If you do not know what kind of jack you have, or need to have one installed, contact the telephone company.

2. Connections

1. Connecting the handset

① Connect the handset as shown and place it on the handset rest.

- The ends of the handset cord are identical, so they will go into either socket.

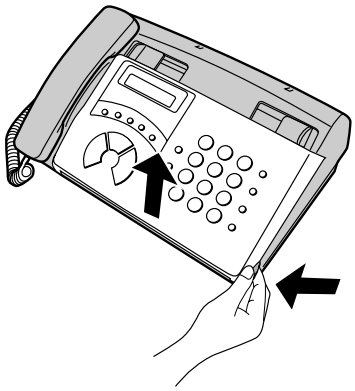


Make sure the handset cord goes into the socket marked with a handset symbol on the side of the machine!

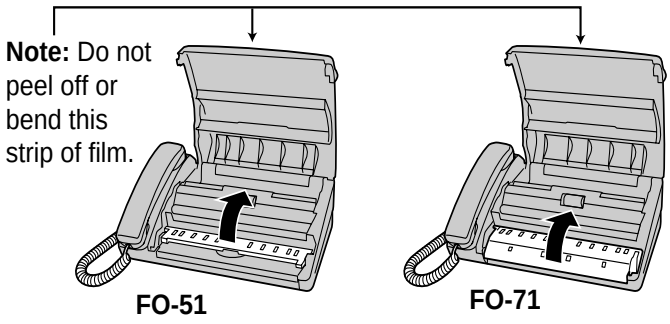
Use the handset to make ordinary phone calls, or to transmit and receive faxes manually.

2. Removing the packing paper

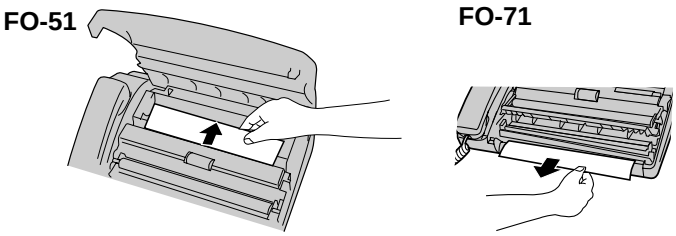
① Grasp the finger hold and open the operation panel.



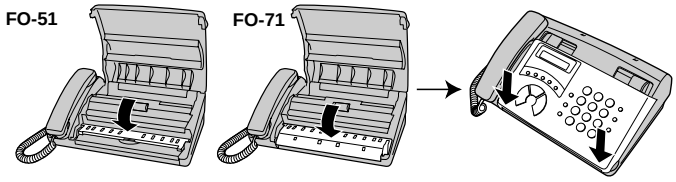
② Flip up the front paper guide.



③ Remove the packing paper.



④ Flip down the front paper guide and then close the operation panel.

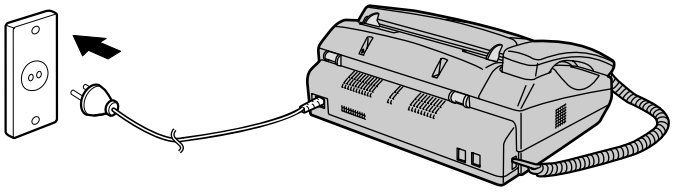


3. Connecting the power cord

① Plug the power cord into a 220 - 240 V, 50/60 Hz, earthed AC (2-prong) outlet.

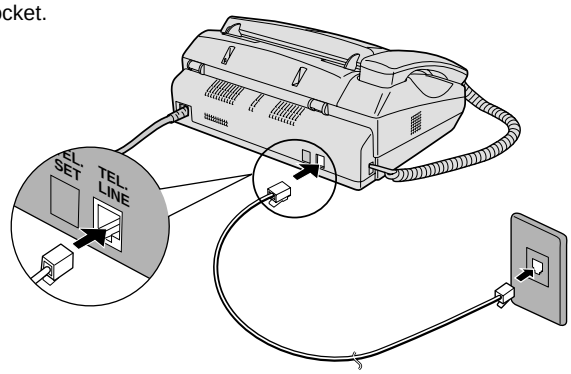
- When disconnecting the fax, unplug the telephone line cord before unplugging the power cord.
- **Caution:**

  Do not plug the power cord into any other kind of outlet. This will damage the machine and is not covered under the warranty.
- The machine does not have a power on/off switch, so the power is turned on and off by simply plugging in or unplugging the power cord.



4. Connecting the telephone line cord

① Insert one end of the line cord into the socket on the back of the machine marked **TEL. LINE.** Insert the other end into a wall telephone socket.



Dial mode: The fax machine is set for tone dialing. If you are on a pulse dial line, you must set the fax machine for pulse dialing. Press the keys on the operation panel as follows:

Display:

1. Press FUNCTION once and (4) once. — OPTION SETTING

2. Press (#) 4 times. — DIAL MODE

3. Select the dial mode:
TONE: (1) PULSE: (2)

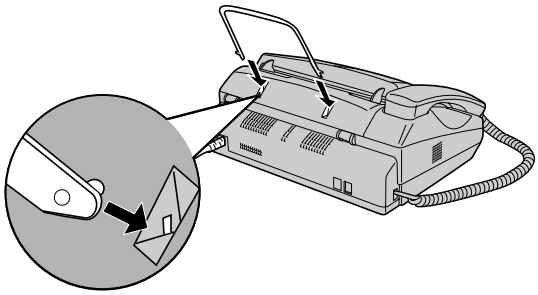
4. Press STOP to exit.

5. Moving your fax and reconnecting

If it is necessary to move your fax to a new location, first disconnect the telephone line cord before disconnecting the power cord. When reconnecting, it is necessary to connect the power cord before connecting the telephone line cord.

6. Attaching the original document support

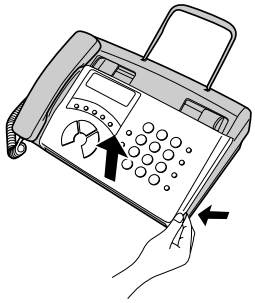
Attach the original document support as shown below.



3. Loading the thermal paper (FO-20PR)

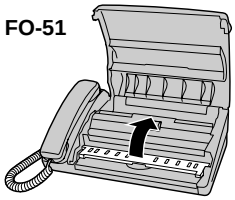
- Your fax machine prints incoming faxes on a special kind of paper called fax paper.
- The fax machine's print head creates text and images by applying heat to the thermal paper.

① Grasp the finger hold as shown and pull up to open the operation panel.

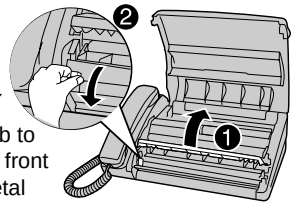


② Flip up the front paper guide.

FO-51



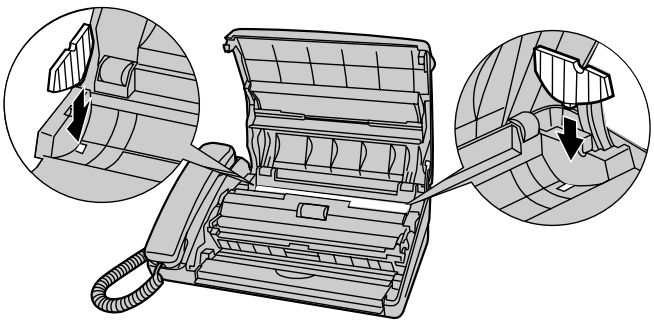
FO-71



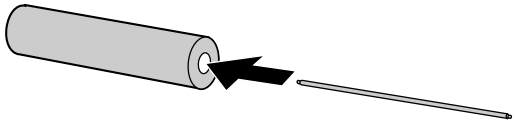
Press the knob to mark sure the front side of the metal guide is down.

③ If you are loading paper that is 210 mm in width, place the paper roll shims on each side of the paper compartment. (Note that Sharp recommended paper, including the initial roll, is 216 mm in width.)

- The ribbed side of the shims should face in (toward each other).

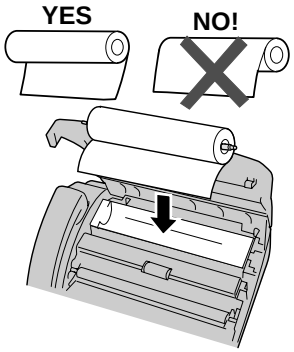


④ Unwrap the roll of thermal paper and insert the paper shaft.

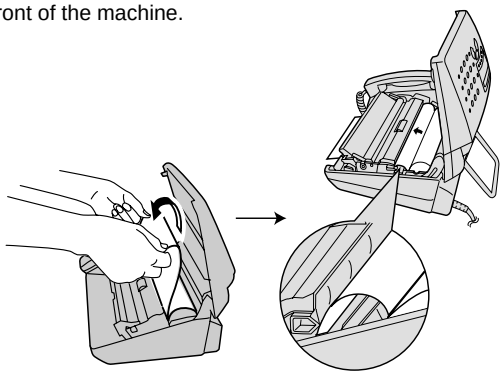


⑤ Place the roll of thermal paper in the compartment, making sure the ends of the paper shaft fit into the notches on each side of the compartment.

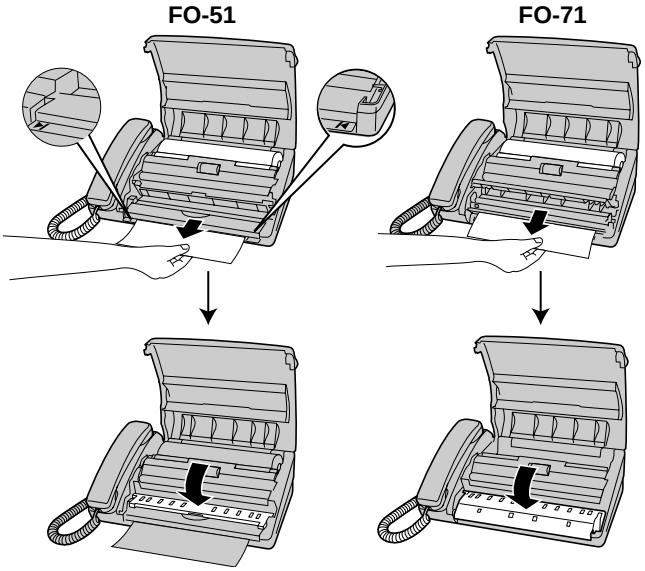
♦ **Important:** The roll must be placed so that the leading edge of the paper unrolls as shown. (The paper is only coated on one side for printing. If the roll is placed backwards, the paper will come out blank after printing.)



⑥ Insert the leading edge of the paper into the slot as shown. Continue to push the paper through the slot until it comes out the opening in the front of the machine.

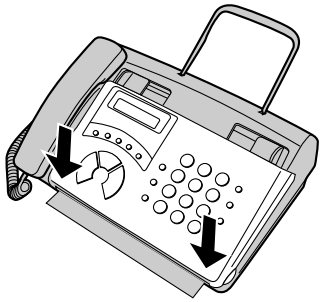


⑦ Make sure the paper comes out straight, and then flip down the paper guide.



⑧ Close the operation panel, making sure it clicks into place.

- A short length of the paper will feed out.
  Grasp the paper by the edge and pull upward to tear it off. **(FO-51)**
- A short length of the paper will be cut off. **(FO-71)**

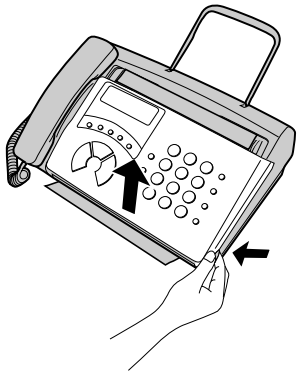


4. Clearing a jammed document

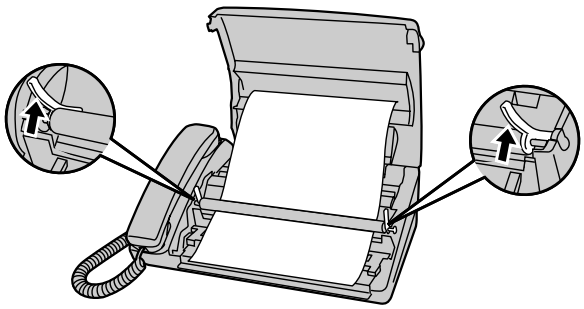
If the original document doesn't feed properly during transmission or copying, or DOCUMENT JAMMED appears in the display, first try pressing the **START** key. If the document doesn't feed out, remove it as explained below.

Important:
Do not try to remove a jammed document without releasing it as explained below. This may damage the feeder mechanism.

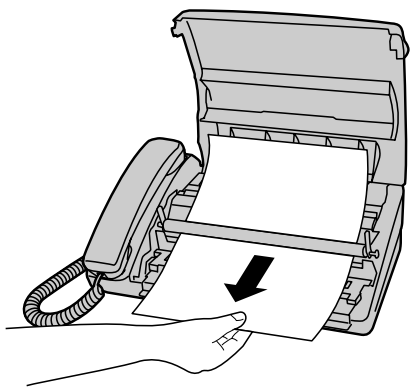
① Grasp the finger hold and pull up to open the operation panel.



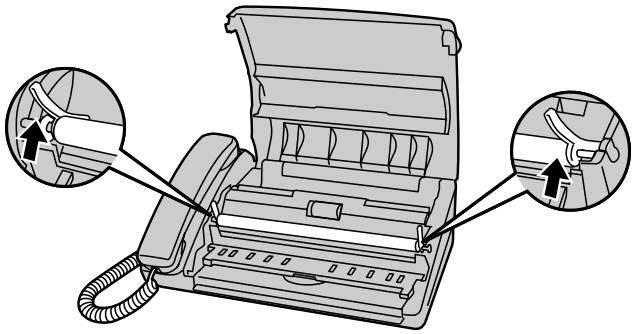
② Flip up the green levers on each side of the white roller.



③ Remove the document.

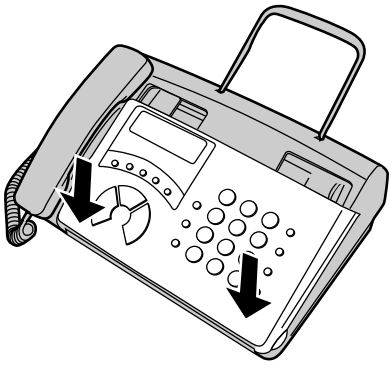


④ Flip down the green levers on each side of the white roller.



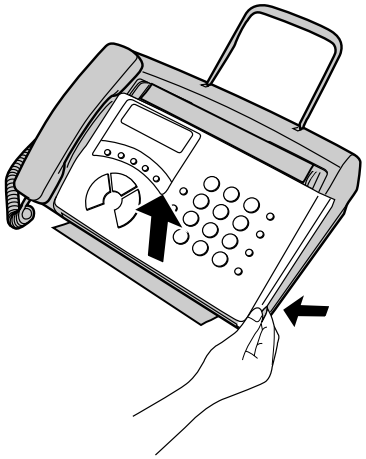
⑤ Close the operation panel, making sure it clicks into place.

- Press down on both front corners of the panel to make sure it clicks into place.



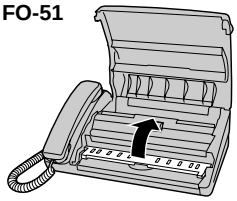
5. Clearing jammed printing paper

① Grasp the finger hold and pull up to open the operation panel.

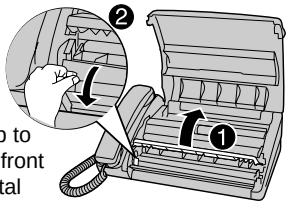


② Flip up the front paper guide.

FO-51



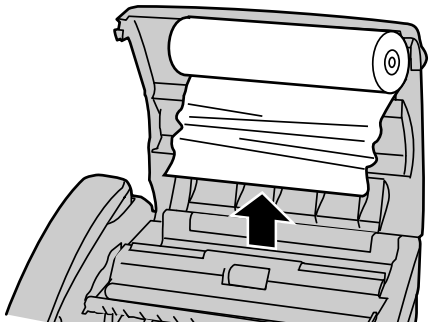
FO-71



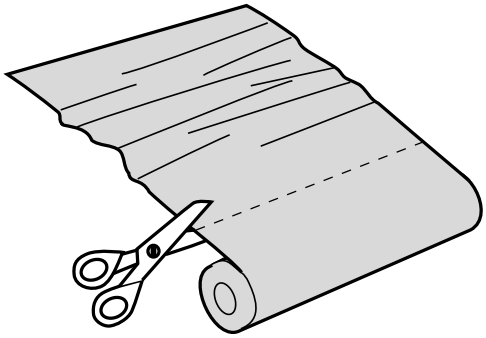
Press the knob to mark sure the front side of the metal guide is down.

③ Remove the paper roll.

- Remove any cut pieces of paper from the paper compartment. **(FO-71 Only)**

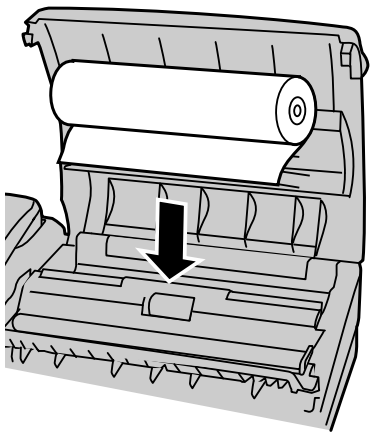


④ Cut off the wrinkled part of the paper.



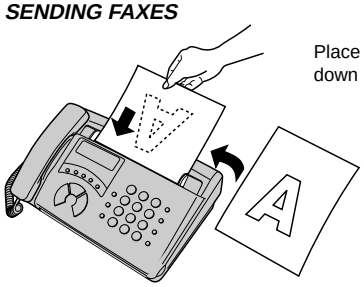
⑤ Reload the paper.

- Jammed paper is often caused by improper loading. Be sure to carefully follow the instructions for paper loading given in Loading the Thermal Paper.



[5] Quick reference guide

SENDING FAXES



Place your document (up to 5 pages) face down in the document feeder.

Normal Dialing

1. Lift the handset or press SPEAKER .
2. Dial the fax number.
3. Wait for the reception tone (if a person answers, ask them to press their Start key).
4. Press START .

Rapid Key Dialing

Press the appropriate Rapid Key. Transmission will begin automatically.

Speed Dialing

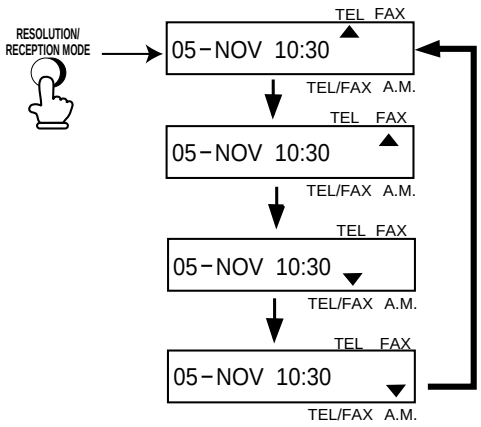
1. Press SPEED DIAL .
2. Enter 2-digit Speed Dial number.
3. Press START .

Direct Keypad Dialing

1. Dial the fax number.
2. Press START .

RECEIVING FAXES

Press the **RESOLUTION/RECEPTION MODE** key until the arrow in the display points to the desired reception mode (make sure the document feeder is empty).



TEL mode: Answer all calls (even faxes) by picking up the handset. To begin fax reception, press START .

FAX mode: The fax machine automatically answers and receives faxes.

TEL/FAX mode: The fax machine automatically answers and receives faxes. Voice calls (including manually dialed fax transmissions) are signalled by a special ringing sound.

A.M. mode: Select this mode when an answering machine is connected to the fax and the answering machine is turned on.

CHAPTER 2. ADJUSTMENTS

[1] Adjustments

General

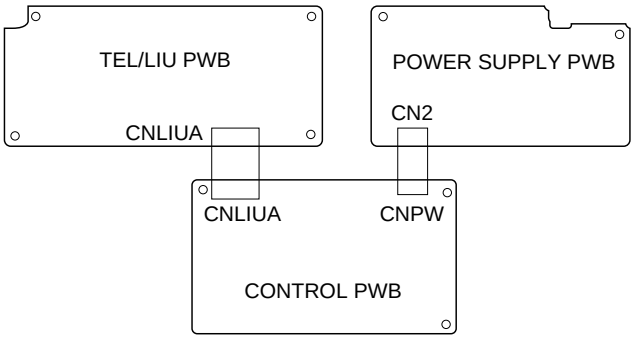
Since the following adjustments and settings are provided for this model, make adjustments and/or setup as necessary.

1. Adjustments

Adjustments of output voltage (FACTORY ONLY)

1. Install the power supply unit in the machine.
2. Set the recording paper and document.
3. When the document is loaded, power is supplied to the output lines. Confirm that outputs are within the limits below.

Output voltage settings



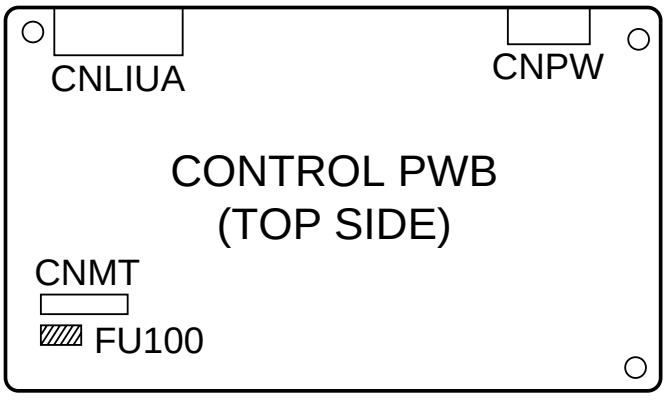
Output	Voltage limits
+5V	4.75V ~ 5.25V
+24V	23.3V ~ 24.7V

Connector No. / Pin No.	CNPW
1	DG
2	+5V
3	MG
4	MG
5	+24V
6	+24V

2. IC protectors replacement

ICPs (IC Protectors) are installed to protect the motor driver circuit. ICPs protect various ICs and electronic circuits from an overcurrent condition.

The location of ICPs are shown below:



(1) FU100 (KAB3202) is installed in order to protect IC's from an overcurrent generated in the motor drive circuit. If FU100 is open, replace it with a new one.

3. Settings

Dial mode selector

DIAL mode (Soft Switch No. SW-B4 DATA No. 2)

(step 1) Select "OPTION SETTING".

KEY : [FUNCTION] (4)

DISPLAY: [OPTION SETTING] ⇔ [PRESS ✳ OR #]

(step 2) Select "DIAL MODE".

KEY: Push (#) until "[DIAL MODE]" is indicated because the number of (#)s changes by the model.

Cursor
When initially registering, the mode shows 1=TONE. When registering again, the mode which was registered formerly is shown.

DISPLAY: [DIAL MODE] ⇔ [1=TONE, 2=PULSE]

(step 3) Select, using "1" or "2".

KEY: (1)

DISPLAY: [TONE SELECTED]

KEY: (2)

DISPLAY: [PULSE SELECTED]

(step 4) End, using the "STOP" key.

KEY: ▽ STOP

4. Volume adjustment

You can adjust the volume of the speaker and ringer using VOLUME key.

(1) Speaker

1. Press the **SPEAKER** key.
2. Press the **VOLUME** key one or more times to select the desired level.

Display:

SPEAKER: MIDDLE
↓
SPEAKER: HIGH
↓
SPEAKER: LOW

• Press **SPEAKER** key again to turn off the speaker.

(2) Ringer

1. Press **VOLUME** key to select the desired volume. (Make sure **SPEAKER** key has not been pressed and the handset is not lifted.)

Display:

RINGER: LOW
↓
RINGER: MIDDLE
↓
RINGER: HIGH
↓
RINGER OFF: OK?

• The ringer will ring once at the selected level, then the date and time will reappear in the display.

2. If you selected RINGER OFF: OK?, press **START** key.

FO-71RA
FO-51RA

[2] Diagnostics and service soft switch

1. Operating procedure

(1) Entering the diagnostic mode

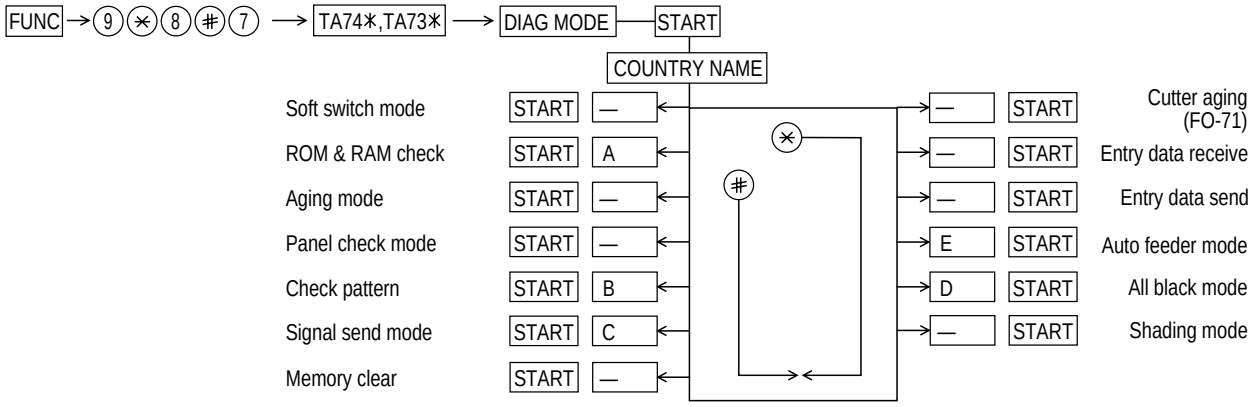
Press FUNC →9→ ✳ →8 →# →7 , and the following display will appear.

ROM Ver. TA74 ✳ (TA73 ✳) After 2 sec: DIAG MODE

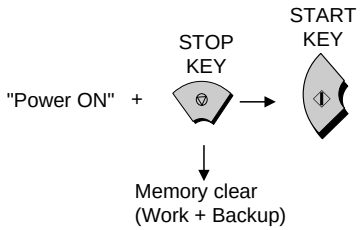
TA74 ✳ (FO-71RA)
TA73 ✳ (FO-51RA)

Then press the START key and country name selected by country select will appear. Select the desired item with the ✳ key or the # key or select with the direct key. Enter the mode with the START key.

(Diag•specifications)



If the diag mode cannot be set, repeat the diag mode operation, performing the following operation.
After the power is turned on and "WAIT A MOMENT" is indicated, press the STOP key.



In relation with the process response (request from Production Engineering) "WAIT A MOMENT" clock indication may appear depending on STOP key timing. If the STOP key is held down, "MEMORY CLEAR?" appears.

2. Diagnostic items

ITEM No.	DIRECT Key	Contents	Function
1	—	SOFT SWITCH MODE	Soft switches are displayed and changed. List can be output.
2	A	ROM & RAM CHECK	ROM is sum-checked, and RAM is matched. Result list is output.
3	—	AGING MODE	10 sheets of check patterns are output every 5 minutes per sheet.
4	—	PANEL CKECK MODE	Panel keys are tested. Result list is output.
5	B	CHECK PATTERN	2 sheets of check patterns are output.
6	C	SIGNAL SEND MODE	Various signals of FAX communication are output.
7	—	MEMORY CLEAR	Back-up memory is cleared, and is set at delivery.
8	—	SHADING MODE	Shading compensation is performed in this mode.
9	D	ALL BLACK PRINT	To check the print head, whole dots are printed over the interval of 2 m.
10	E	AUTO FEEDER MODE	Insertion and discharge of document are tested.
11	—	ENTRY DATA SEND	Registered content is sent.
12	—	ENTRY DATA RECEIVE	Registered content is received, and its list is output.
13	—	CUTTER AGING	Recording paper is successively cut. (FO-71 only)

3. Diagnostic items description

3. 1. Soft switch mode

The soft switches are provided so that each operation mode can be set by using the operation panel.

In this mode, these switches can be checked and set.

The contents of these switches are backed up.

The available soft switches are SW-A1 to SW-K1.

The content of soft switches is shown in page 2-5 to 2-17.

The contents are set to factory default settings.

3. 2. ROM & RAM check

ROM executes the sum check, and RAM executes the matching test. The result will be notified with the number of short sounds of the buzzer as well as by printing the ROM & RAM check list.

Number of short sounds of buzzer 0 → No error
1 → ROM error
2 → RAM error (4 Kbytes SRAM or 512 Kbyts DRAM)

3. 3. Aging mode

If any document is first present, copying will be executed sheet by sheet. If no document is present, the check pattern will be printed sheet by sheet. This operation will be executed at a rate of one sheet per 5 minutes, and will be ended at a total of 10 sheets.

3. 4. Panel check mode

This mode is used to check whether each key operates properly or not. Press the key on the operation panel, and the key will be displayed on the display. Therefore, press all keys. At this time,finally press the STOP key.

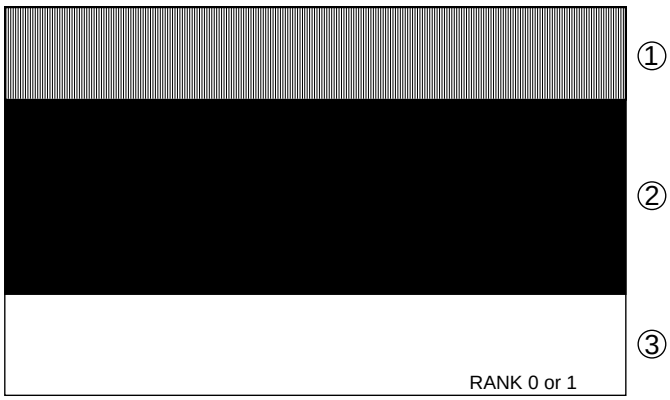
When the STOP key is pressed, the keys which are not judged as "pressed" will be printed on the result list.

- LED part of the contact image sensor (CIS) is kept on during the term from when "START" of the panel test mode to end with the STOP key.

3. 5. Check pattern

This mode is used to check the status of print head. Two sheets of check pattern are printed. The following information of check pattern is printed.

① Vertical stripes (alternate white and black lines) Approx. 35 mm
② Full black Approx. 70 mm
③ Full white Approx. 35 mm



Note:
There is a selection RANK 0 or 1 depending on resistance value of the thermal head. RANK 0 or RANK 1 is printed at the tail of check pattern to identify.

3. 6. Signal send mode

This mode is used to send various signals to the circuit during FAX communication. Every push of START key sends a signal in the following sequence. Moreover, the signal sound is also output to the speaker when the line monitor of the soft switch is on.

[1] No signal (CML signal turned on)
[2] 9600bps
[3] 7200bps
[4] 4800bps
[5] 2400bps
[6] 300bps (FLAG)
[7] 2100Hz (CED)
[8] 1100Hz (CNG)
[9] Pseudo Ring (models with auto TEL/FAX changeover function)
[10] END

3. 7. Memory clear

This mode is used to clear the backup memory and reset to the default settings.

3. 8. Shading mode

The mode is used for the shading compensation. For reading, set up the special original paper.

The compensation memorizes the reference data of white and black for reading.

Moreover, the memorized data is not erased even if memory clear mode is executed.

3. 9. All black print

This mode is used to check the state of the printing head and intentionally overheat it. Whole dots are printed over the interval of 2 m. If it is overheated or the printing sheet is jammed, press STOP key for the end.

3. 10. Auto feeder mode

In this mode, a document is inserted and discharged to check the auto feed function.

After this mode is started, set a document, and the document feed will be automatically tested.

3. 11. Entry data send

This mode is used to send the registered data to the other machine and make the other machine copy the registered content. Before sending in this mode, it is necessary to set the other machine at the entry data receive mode.

The contents to be sent are as follows (the machine prints each list after the transmission has completed):

1. Telephone list data
2. Sender (cover sheet) register data
3. Optional setting content
4. Soft switch content
5. Junk fax number list
6. Timer reservation data (only on the model which timer reservation is possible)
7. Passcord No. (only for the type with polling function)

3. 12. Entry data receive

In this mode, the registered data sent from the other machine is received and the received data is registered in the machine. When this mode is used for receiving, the other machine must be in the entry data send mode.

After receiving is completed, the machine prints the following lists:

1. Telephone list data
2. Passcode No. (only for the type with polling function)
3. Soft switch list
4. Junk fax number list
5. Timer reservation data (only model which timer communication is possible)

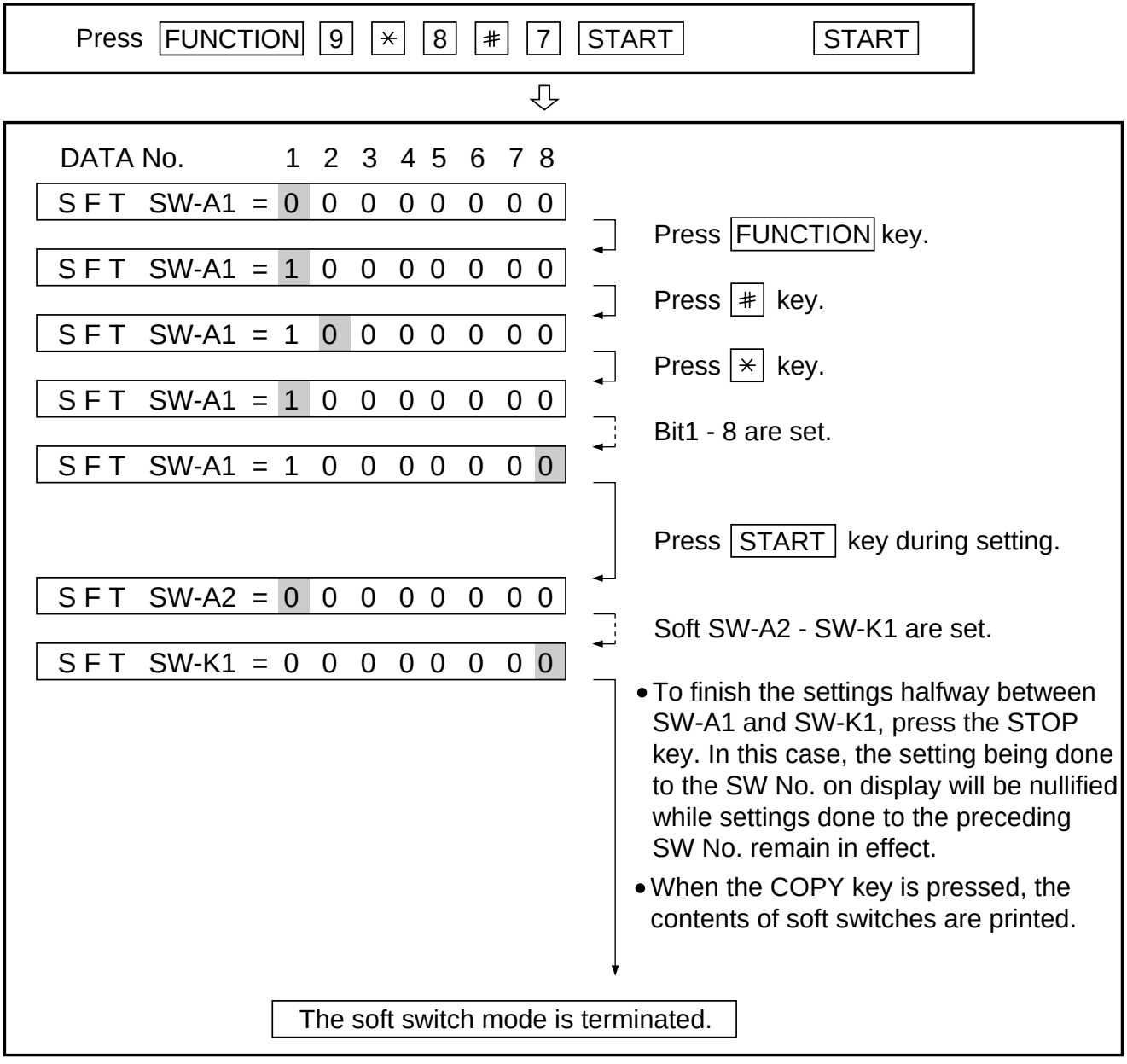
3. 13. Cutter aging (FO-71 only)

This mode is used to consecutively cut the recording paper about 10 mm long and to display the number of cutting times.
(The number of cutting times is cumulatively counted unless you execute the memory clear or power off.)
The operation is stopped in the following cases:

1. Hold down the stop key. (The cutter aging is stopped.)
2. No recording paper. (The cut operation is stopped.)
3. Recording paper jam. (The cut operation is stopped.)

4. How to make soft switch setting

To enter the soft switch mode, press the following key entries in sequence.


Press FUNCTION 9 ✳ 8 # 7 START
START
DATA No. 1 2 3 4 5 6 7 8
S F T SW-A1 = 0 0 0 0 0 0 0 0
S F T SW-A1 = 1 0 0 0 0 0 0 0
S F T SW-A1 = 1 0 0 0 0 0 0 0
S F T SW-A1 = 1 0 0 0 0 0 0 0
S F T SW-A1 = 1 0 0 0 0 0 0 0
S F T SW-A2 = 0 0 0 0 0 0 0 0
S F T SW-K1 = 0 0 0 0 0 0 0 0
Press FUNCTION key.
Press # key.
Press ✳ key.
Bit1 - 8 are set.
Press START key during setting.
Soft SW-A2 - SW-K1 are set.
• To finish the settings halfway between SW-A1 and SW-K1, press the STOP key. In this case, the setting being done to the SW No. on display will be nullified while settings done to the preceding SW No. remain in effect.
• When the COPY key is pressed, the contents of soft switches are printed.
The soft switch mode is terminated.

5. Soft switch description

• Soft switch

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting					Remarks
			1	0	RA					
SW I A1	1	Protect from echo	No	Yes	0					
	2	Forced 4800 BPS reception	Yes	No	0					
	3	Footer print	Yes	No	0					
	4	Length limitation of copy/send/receive	No limit	Copy/send: 60cm Receive: 1.5m	0					
	5	CSI transmission	No transmitted	Transmitted	0					
	6	DIS receive acknowledgement during G3 transmission	Twice	NSF: Once DIS: Twice	0					
	7	Nonmodulated carrier for V29 transmission mode	Yes	No	0					
	8	Reserved			0					
SW I A2		Modem speed		V.29		V.27 ter				
				9600bps	7200bps	4800bps	2400bps			
	1		No. 1	0	0	0	0	0		
	2		No. 2	0	0	0	0	0		
	3		No. 3	0	1	1	0	0		
	4		No. 4	1	1	0	0	1		
	5	Reserved						0		
	6	H2 mode	No	Yes				0		
	7	Communication error treatment in RTN sending mode (reception)	No communication error	Communication error				0		
	8	CNG transmission	No	Yes				0		
SW I A3		CED tone signal interval		1000ms	750ms	500ms	75ms			
	1		No. 1	1	1	0	0	0		
	2		No. 2	1	0	1	0	0		
	3	MR coding	No	Yes				0		
	4	Reserved						0		
	5	Reserved						0		
	6	Reserved						0		
	7	Reserved						0		
	8	Reserved						0		
SW I A4		Signal transmission level (0 ~ -31 dBm setting by 1 dBm step)	Binary input No. = 16 8 4 2 1							
	1		1 2 3 4 5					0		
	2		0 1 1 0 0 (-12dB)					1		
	3							1		
	4							0		
	5							0		
	6	Protocol monitor (error print)	Printed at com. error	Not printed				0		
	7	Protocol monitor	Yes	No				0		
	8	Line monitor	Yes	No				0		
SW I A5		Digital equalization setting (Reception)		7.2km	0km					
	1		No. 1	1	0			1		
	2		No. 2	1	0			1		
		Digital line equalization setting		7.2km	0km					
	3	(Transmitter)	No. 3	1	0			0		
	4		No. 4	1	0			0		
		Digital equalization setting (Reception		7.2km	0km					
	5	for Caller ID)	No. 5	1	0			0		
	6		No. 6	1	0			0		
	7	Error criterion	10 ~ 20 %	5 ~ 10 %				0		
	8	Anti junk fax check	Yes	No				1		

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting					Remarks
			1	0	RA					
SW I A6	1	Reserved			0					
	2	End Buzzer	Yes	No	1					
	3	Disconnect the line when DIS is received in RX mode	No	Yes	1					
	4	Equalizer freeze control (MODEM)	On	Off	0					
	5	Equalizer freeze control 7200 BPS only	No	Yes	0					
	6	CNG transmission in manual TX mode	Yes	No	1					
	7	Initial compression scheme for sharp fax in TX mode	MR mode	H2 mode	0					
	8	Modem speed automatic down when RX level is under -40dBm	Yes	No	0					
SW I A7		EOL detect timer		5sec. / 13sec. / 20sec. / 25sec.						
	1		No. 1	0 / 0 / 1 / 1	0					
	2		No. 2	0 / 1 / 0 / 1	1					
	3	Reserved			0					
	4	Reserved			0					
	5	Reserved			0					
	6	Reserved			0					
	7	Reserved			0					
	8	Reserved			0					
SW I B1	1	Hold key	Enable	Disable	1					
	2	Auto dial fax transmission by REDIAL key	Yes	No	0					
	3	Reserved			0					
	4	Recall interval	Binary input		0					
	5	(0 ~ 15.5 min setting by 0.5 min step)	No. = 16 8 4 2 1		1					
	6		4 5 6 7 8		0					
	7		0 1 0 1 0		1					
	8				0					
SW I B2	1	Recall times (0 ~ 15 times setting)	Binary input		0					
	2		No. = 8 4 2 1		0					
	3		1 2 3 4		1					
	4		0 0 1 0		0					
	5	Dial tone detection (before auto dial)	No	Yes	1					
	6	Reserved			0					
	7	Busy tone detection (after auto dial)	No	Yes	1					
	8	Busy tone detection pulse number (after auto dial)	4 pulses	2 pulses	0					
SW I B3		Waiting time after dialing		45 seconds / 55 seconds / 90 seconds / 140 seconds						
	1		No.1	0 / 0 / 1 / 1	0					
	2		No.2	0 / 1 / 0 / 1	0					
	3	Reserved			0					
	4	Reserved			0					
	5	Reserved			0					
	6	Reserved			0					
	7	Reserved			0					
	8	Reserved			0					
SW I B4	1	Dial pause (sec/pause)	4sec	2sec	0					
	2	Dial mode	Tone	Pulse	0					OPTION
	3	Pulse → Tone change function by ✳ key	Enable	Disable	1					
	4	Dial pulse make/break ratio (%)	40/60	33/67	1					
		Auto dial mode Delay timer of before line		0 second / 1.5 seconds / 3.0 seconds / 4.5 seconds						
	5	connect	No.5	0 / 0 / 1 / 1	1					
	6		No.6	0 / 1 / 0 / 1	0					
	7	Reserved			0					
	8	Reserved			0					

SW NO.	DATA NO.	ITEM	Switch setting and function									Initial setting						Remarks
			1								0	RA						
SW I B5		Auto dial mode Delay timer of after line		1.7s	2.0s	2.5s	3.0s	3.6s	4.0s	5.5s	7.0s							
	1	connect	No. 1	0	0	0	0	1	1	1	1	0						
	2		No. 2	0	0	1	1	0	0	1	1	1						
	3		No. 3	0	1	0	1	0	1	0	1	1						
	4	Fax signal detection after telephone mode dial	Yes								No	0						
	5	Recalling fixed only one time when dialing was unsuccessful without detecting busy tone signal	Yes								No	0						
	6	Reserved										0						
	7	Reserved										0						
	8	Reserved										0						
SW I B6		DTMF signal transmission level (Low frequency 0 ~ 15.5 dBm setting by 0.5 dBm step)	Binary input															
			No. =	16	8	4	2	1										
	1			1	2	3	4	5				0						
	2			0	1	0	1	1				1						
	3											0						
	4											1						
	5											1						
	6	Reserved										0						
	7	Reserved										0						
	8	Reserved										0						
SW I B7		DTMF signal transmission level (High frequency 0 ~ 15.5 dBm setting by 0.5 dBm step)	Binary input															
			No. =	16	8	4	2	1										
				1	2	3	4	5										
	2			1	0	1	0	1				1						
	2											0						
	3											1						
	4											0						
	5											1						
	6	Reserved										0						
	7	Reserved										0						
	8	Reserved										0						
SW I C1		Reading slice (Binary)		Factory setting		Light		Dark		Darker in dark								
	1		No. 1	0		1		0		1		0						
	2		No. 2	0		0		1		1		0						
		Reading slice (Half tone)		Factory setting		Light		Dark		Darker in dark								
	3		No. 3	0		1		0		1		0						
	4		No. 4	0		0		1		1		0						
	5	Line density selection	Fine								Standard	0						
	6	Reserved										0						
	7	MTF correction in half tone mode	No								Yes	0						
	8	Reserved										0						
SW I D1		Number of rings for auto receive	Binary input															OPTION
	1	(0 ~ 15rings setting)	No. =	8	4	2	1					0						
	2			1	2	3	4					0						
	3			0	0	1	0					1						
	4											0						
	5	Automatic switching manual to auto receive function	Yes								No	0						
		CI detect frequency		As PTT		11.5Hz		13.0Hz		20.0Hz								
	6		No.6	0		0		1		1		0						
	7		No.7	0		1		0		1		0						
	8	Reserved										0						

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SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting					Remarks
			1	0	RA					
SW I D2	1	Reserved			0					
	2	Reserved			0					
	3	Reserved			0					
	4	Reserved			0					
	5	Reserved			0					
	6	Caller ID function	Yes	No	0					
	7	Reserved			0					
	8	Reserved			0					
SW I D3	1	CI off detection timer (0 ~ 1550 ms setting by 50 ms step)	Binary input No. = 16 8 4 2 1		0					
	2				1					
	3		1 2 3 4 5		1					
	4		0 1 1 1 0		1					
	5				0					
	6	Reserved			0					
	7	Reserved			0					
	8	Reserved			0					
SW I D4	1	DTMF type caller ID RX level	Binary input		1					
	2	(0 ~ -44 dBm setting by 1 dBm step)	No. = 32 16 8 4 2 1		0					
	3		1 2 3 4 5 6		1					
	4		1 0 1 1 0 0		1					
	5				0					
	6				0					
	7	Reserved			0					
	8	Reserved			0					
SW I E1		Pseudo ringing time at the TEL/FAX automatic switching mode								
	1		No. 1	0 0 0 0 1 1 1 1	0					
	2		No. 2	0 0 1 1 0 0 1 1	1					
	3		No. 3	0 1 0 1 0 1 0 1	0					
	4	Number of CNG signal detection at the TEL/FAX automatic switching mode	Twice	Once	1					
	5	CNG detection period when TEL/FAX mode	3 sec	5 sec	0					
	6	Post answer tone (TEL/FAX mode)	No	Yes	1					
	7	Type of post answer tone	LA-SI-DO tone	800Hz single tone	1					
	8	Pseudo ringer ON/OFF cycle	1 sec ON/4 sec OFF	1 sec ON/2 sec OFF	0					
SW I E2	1	Pseudo ringer sound modem TX level	Binary input		1					
	2	(0 ~ -15 dBm setting by 1 dBm step)	No. = 8 4 2 1		0					
	3		1 2 3 4		1					
	4		1 0 1 0		0					
		Post answer tone transmission level	Binary input							
	5	(0 ~ -15 dBm setting by 1 dBm step)	No. = 8 4 2 1		1					
	6		5 6 7 8		1					
	7		1 1 0 0		0					
	8				0					
SW I E3	1	Disconnect the line when DTMF "#" is received during TEL/FAX automatic switching mode	Yes	No	0					
	2	Reserved			0					
	3	Reserved			0					
	4	Reserved			0					
	5	Reserved			0					
	6	Reserved			0					
	7	Reserved			0					
	8	Reserved			0					

	9sec	15sec	30sec	60sec	90sec	120sec	150sec	180sec
No. 1	0	0	0	0	1	1	1	1
No. 2	0	0	1	1	0	0	1	1
No. 3	0	1	0	1	0	1	0	1

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting					Remarks
			1				0	RA					
SW I F1		DTMF detection time		50ms	80ms	100ms	120ms						
	1		No. 1	0	0	1	1	0					
	2		No. 2	0	1	0	1	0					
	3	Protection of remote reception (5 ✳✳) detection	Yes			No		0					
	4	Remote reception with GE telephone	Compatible			Not compatible		1					
	5	Remote operation code figure by external	Binary input					0					OPTION
	6	TEL (0~9)	No. = 8 4 2 1					1					
	7		5 6 7 8					0					
	8		0 1 0 1					1					
SW I F2	1	CNG detection in STAND-BY mode	Yes			No		1					OPTION
		Number of CNG detect (AM mode)		1pulse	2pulses	3pulses	4pulses						
	2		No. 2	0	0	1	1	0					
	3		No. 3	0	1	0	1	1					
		Number of CNG detect (STAND-BY mode)		1pulse	2pulses	3pulses	4pulses						
	4		No. 4	0	0	1	1	0					
	5		No. 5	0	1	0	1	1					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I G1	1	Quiet detect time	Binary input					0					OPTION
	2	(0 ~ 15 sec setting by 1 sec step)	No. = 8 4 2 1					1					
	3		1 2 3 4					0					
	4		0 1 0 0					0					
	5	Quiet detect start timing	Binary input					0					OPTION
	6	(0 ~ 15 sec setting by 1 sec step)	No. = 8 4 2 1					1					
	7		5 6 7 8					0					
	8		0 1 0 1					1					
SW I G2	1	Reserved						0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I G3		OGM detect timer		Not work	100ms	200ms	300ms						
	1		No. 1	0	0	1	1	0					
	2		No. 2	0	1	0	1	1					
		Section time of quiet detection		30s	40s	50s	60s						
	3		No. 3	0	0	1	1	0					
	4		No. 4	0	1	0	1	1					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I G4	1	Quiet detect level setting	Binary input					1					
	2	(0 ~ -44 dBm setting by 1 dBm step)	No. = 32 16 8 4 2 1					0					
	3		1 2 3 4 5 6					1					
	4		1 0 1 1 0 0					1					
	5							0					
	6							0					
	7	Fax switching when A.M. full	Yes			No		0					OPTION
	8	Reserved						0					

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SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting					Remarks
			1		0			RA					
SW I H1	1	Busy tone continuous sound detect time	5sec		10sec			1					
	2	Reserved						0					
	3	Busy tone detect continuation sound detect	No		Yes			0					
	4	Reserved						0					
	5	Busy tone detect intermittent sound detect	No		Yes			0					
		Busy tone detection pulse number		2pulses	4pulses	6pulses	10pulses						
	6		No. 6	0	0	1	1	0					
	7		No. 7	0	1	0	1	1					
	8	Reserved						0					
SW I H2		Busy tone detection ON/OFF time (Lower		150ms	200ms	250ms	350ms						
	1	duration)	No. 1	0	0	1	1	0					
	2		No. 2	0	1	0	1	0					
		Busy tone detection ON/OFF time (Upper		650ms	900ms	1500ms	2700ms						
	3	duration)	No. 3	0	0	1	1	0					
	4		No. 4	0	1	0	1	1					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I I1	1	Reserved						0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I I2	1	Reserved						0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I I3	1	Reserved						0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I I4	1	Reserved						0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting					Remarks
			1				0	RA					
SW I I5	1	Reserved						0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I I6	1	Reserved						0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I I7	1	Reserved						0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I I8	1	Reserved						0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I J1	1	Sender’s phone number setting	Cannot change				Change allowed	0					
	2	Reserved						0					
	3	Ringer volume		Off	Low	Middle	High						OPTION
			No. 3	0	0	1	1	1					
	4		No. 4	0	1	0	1	0					
	5	Speaker volume		Low	Low	Middle	High						OPTION
			No. 5	0	0	1	1	1					
	6		No. 6	0	1	0	1	0					
	7	Polling key	Yes				No	0					OPTION
	8	Reserved						0					
SW I J2	1	Reserved						0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					

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SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting					Remarks
			1			0		RA					
SW I J3		Communication results printout (Transaction report)		Error	Send only	Always	No print						OPTION
	1		No. 1	0	0	0	0	0					
	2		No. 2	0	0	1	1	0					
	3		No. 3	0	1	0	1	0					
	4	Time format	12 hour			24 hour		0					
	5	Date format	Month-Day-Year			Day-Month-Year		0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					
SW I K1	1	Entering diag mode by pressing SPEED key	Yes			No		0					
	2	Reserved						0					
	3	Reserved						0					
	4	Reserved						0					
	5	Reserved						0					
	6	Reserved						0					
	7	Reserved						0					
	8	Reserved						0					

• Soft switch function description

SW-A1 No. 1 Protect from echo

Used to protect from echo in reception.

SW-A1 No. 2 Forced 4800BPS reception

When line conditions warrant that receptions take place at 4800 BPS repeatedly.
It may improve the success of receptions by setting at 4800BPS.
This improves the receiving document quality and reduces handshake time due to fallback during training.

SW-A1 No. 3 Footer print

When set to "1", the date of reception, the sender machine No., and the page No. are automatically recorded at the end of reception.

SW-A1 No. 4 Length limitation of copy/send/receive

Used to set the maximum page length.
To avoid possible paper jam, the page length is normally limited to 0.6 meter for copy or transmit, and 1.5 meters for receive.
It is possible to set it to "No limit" to transmit a long document, such as a computer print form, etc. (In this case, the receiver must also be set to no limit.)

SW-A1 No. 5 CSI transmission

(CSI TRANSMISSION) is a switch to set whether the machine sends or does not send the signal (CSI signal) informing its own telephone No. to the remote fax machine when information is received. When "nonsending" is set, the telephone No. is not output on the remote transmitting machine if the remote transmitting machine has the function to display or print the telephone No. of receiving machine, using this CSI signal.

SW-A1 No. 6 DIS receive acknowledgment during G3 transmission

Used to make a choice of whether reception of DIS(NSF) is acknowledged after receiving two DISs(NSFs) or receiving one DIS (two NSFs). It may be useful for overseas communication to avoid an echo suppression problem, if set to 1.

SW-A1 No. 7 Nonmodulated carrier for V29 transmission mode

Though transmission of a nonmodulated carrier is not required for transmission by the V29 modem according to the CCITT Recommendation, it may be permitted to a send nonmodulated carrier before the image signal to avoid an echo suppression problem.
It may be useful for overseas communication to avoid an echo suppression problem, if set to 1.

SW-A1 No. 8 Reserved

Set to "0".

SW-A2 No. 1 ~ No. 4 Modem speed

Used to set the initial modem speed. The default is 9600BPS.
It may be necessary to program it to a slower speed when frequent line fallback is encountered, in order to save the time required for fallback procedure.

SW-A2 No. 5 Reserved

Set to "0".

SW-A2 No. 6 H2 mode

Used to determine reception of H2 mode (15 sec transmission mode). When set to OFF, H2 mode reception is inhibited even though the transmitting machine has H2 mode function.

SW-A2 No. 7 Communication error treatment in RTN sending mode (Reception)

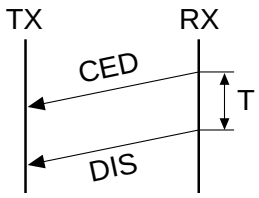
Used to determine communication error treatment when RTN is sent by occurrence of a received image error in G3 reception. When it is set to "1", communication error is judged as no error.

SW-A2 No. 8 CNG transmission

When set to "0", this model allows CNG transmission by pressing the Start key in the key pad dialing mode. When set to "1", CNG transmission in the key pad dialing mode cannot be performed. In either case, CNG transmission can be performed in the auto dial mode.

SW-A3 No. 1, No. 2 CED tone signal interval

For international communication, the 2100Hz CED tone may act as an echo suppression switch, causing a communication problem.
Though SW-A3 No. 1 and No. 2 are normally set to 0, this setting is used to change the time between the CED tone signal to eliminate the communication caused by echo.



SW-A3 No. 3 MR coding

Used to select the MR coding enable or disable.

SW-A3 No. 4 ~ No. 8 Reserved

Set to "0".

SW-A4 No. 1 ~ No. 5 Signal transmission level (0 ~ -31 dBm setting by 1dBm step)

Used to control the signal transmission level in the range of -0dB to -31dB.
The factory setting is at -12dB (MODEM output).

SW-A4 No. 6 Protocol monitor (Error Print)

If set to "1", protocol is printed at communication error.

SW-A4 No. 7 Protocol monitor

Normally set to "0". If set to "1", communication can be checked, in case of trouble, without using a G3 tester or other tools.
When communication FSK data transmission or reception is made, the data is taken into the buffer. When communication is finished, the data is analyzed and printed out. When data is received with the line monitor (SW-4 No. 8) set to "1" the reception level is also printed out.

SW-A4 No. 8 Line monitor

Normally set to "0". If set to "1", the transmission speed and the reception level are displayed on the LCD. Used for line tests.

SW-A5 No. 1, No. 2 Digital equalization setting (Reception)

Line equalization when reception is to be set according to the line characteristics.
Setting should be made according to distance between the telephone and the telephone company central switching station.

SW-A5 No. 3, No. 4 Digital equalization setting (Transmitter)

Line equalization when transmission is to be set according to the line characteristics.
Setting should be made according to distance between the telephone and the telephone company central switching station.

SW-A5 No. 5, No. 6 Digital equalization setting (Reception for Caller ID)

Line equalization when reception for CALLER ID is to be set according to the line characteristics.
Setting should be made according to distance between the telephone and the telephone company central switching station.

SW-A5 No. 7 Error criterion

Used to select error criterion for sending back RTN when receiving image data.

SW-A5 No. 8 Anti junk fax check

When using the Anti junk fax function, set to "1".

SW-A6 No. 1 Reserved

Set to "0".

SW-A6 No. 2 End buzzer

Setting this bit to 0 will disable the end buzzer (including the error buzzer/ on-hook buzzer).

SW-A6 No. 3 Disconnect the line when DIS is received in RX mode

Bit1 = 0 : When DIS signal is received during RX mode, disconnect the line immediately.
Bit1 = 1 : When DIS signal is received during RX mode, wait for the next signal.

SW-A6 No. 4 Equalizer freeze control (MODEM)

This switch is used to perform reception operation by fixing the equalizer control of modem for the line which is always in unfavorable state and picture cannot be received.
* Usually, the control is executed according to the state of line where the equalizer setting is changed always.

SW-A6 No.5 Equalizer freeze 7200BPS only

Setting which specifies SW-A6 No. 4 control only in condition of 7200BPS modem speed.

SW-A6 No. 6 CNG transmission in manual TX mode

When set to "1", fax transmit the CNG signal in case of manual transmission mode (User press the START key after waiting for the fax answering signal from handset or speaker).

SW-A6 No. 7 Initial compression scheme for sharp fax in TX mode

When set to "0", if the other fax is Sharp model, fax transmit the document by H2 mode.
When set to "1", even if the other fax is Sharp model, fax transmit the document by MR mode.

SW-A6 No. 8 Modem speed automatic down when RX level is under -40dBm

When set to "1", if fax signal level is under -40dBm during reception, machine selects the slower modem speed automatically.
It is effective when noises occur on the received document due to the long distance communications.

SW-A7 No. 1, No. 2 EOL (End Of Line) detect timer

Used to make a choice of whether to use the 5 or 13 or 20 or 25 seconds timer for detection of EOL.
This is effective to override communication failures with some facsimile models that have longer EOL detection.

SW-A7 No. 3 ~ No. 8 Reserved

Set to "0".

SW-B1 No. 1 Hold key

Used to set YES/NO of holding function by the HOLD key.

SW-B1 No. 2 Auto dial fax transmission by REDIAL key

When set to "1", if original documents are set to the feeder and you press REDIAL key, machine will dial and transmit the documents automatically.
When set to "0", operator needs to press the START key after FAX reception tone is heard.

SW-B1 No. 3 Reserved

Set to "0".

SW-B1 No. 4 ~ No. 8 Recall interval (0 ~ 15.5min setting by 0.5min step)

Choice is made for a redial interval for speed and rapid dial calls.
Use a binary number to program this with 0.5min steps. If set to 0 accidentally, 0.5min will be assumed.

SW-B2 No. 1 ~ No.4 Recall times (0 ~ 15times setting)

Choice is made as to how many redials there should be.

SW-B2 No. 5 Dial tone detection (Before auto dial)

Used to set YES/NO of dial tone detection in auto dialing.

SW-B2 No. 6 Reserved

Set to "0".

SW-B2 No. 7 Busy tone detection (After auto dial)

Used to set YES/NO of busy tone detection after auto dialing.

SW-B2 No. 8 Busy tone detection pulse number (After auto dial)

Used for detection of busy tone in 2 or 4 pulses.

SW-B3 No. 1, No. 2 Waiting time after dialing

This is waiting time for the opponent's signals after dialing.
45 / 55 / 90 / 140 seconds settings are available.

SW-B3 No. 3 ~ No. 8 Reserved

Set to "0".

SW-B4 No. 1 Dialing pause (sec/pause)

Pauses can be inserted between telephone numbers of direct dial connection. Selection of 4 sec or 2 sec pause is available.

SW-B4 No. 2 Dial mode

When using the pulse dial, set to 0. When using the tone dial, set to 1.

SW-B4 No. 3 Pulse → Tone change function by ✳ key

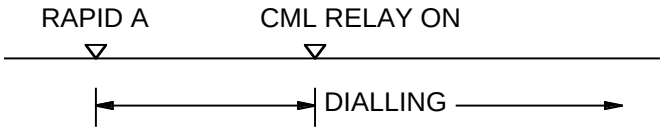
When setting to 1, the mode is changed by pressing the ✳ key from the pulse dial mode to the tone dial mode.

SW-B4 No. 4 Dial pulse make/break ratio (%)

When using the 33% make ratio pulse dial, set to 0.
When using the 40% make ratio pulse dial, set to 1.

SW-B4 No. 5, No. 6 Auto dial mode Delay timer of before line connect

Delay time between the dial key input and line connection under the auto dial mode.



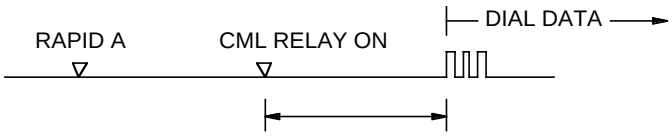
No.5=0 No.6=0 : 0sec
No.5=0 No.6=1 : 1.5sec
No.5=1 No.6=0 : 3.0sec
No.5=1 No.6=1 : 4.5sec

SW-B4 No. 7, No. 8 Reserved

Set to "0".

SW-B5 No. 1 ~ No. 3 Auto dial mode Delay timer of after line connect

Delay time between the line connection and dial data output under the auto dial mode.
This setting is available when dial tone detection(SW-B2 No. 5) is set to "NO".



No. 1	No. 2	No. 3	
0	0	0	1.7sec
0	0	1	2.0sec
0	1	0	2.5sec
0	1	1	3.0sec
1	0	0	3.6sec
1	0	1	4.0sec
1	1	0	5.5sec
1	1	1	7.0sec

SW-B5 No. 4 Fax signal detection after telephone mode dial

When set to "1", if machine detects the fax answering signal after telephone calling (handset off-hook or speaker mode dial), machine starts to receive the documents automatically.

SW-B5 No. 5 Recalling fixed only one time when dialing was unsuccessful without detecting busy tone signal

When dialing results in failure since the busy tone cannot be detected, recalling is fixed to one time.

Supplementary explanation
If time-out termination is made when dialing, only single recall is possible even if the setting time of recalls (SW-B2 No. 1 - No. 4) has been set to some times. This soft switch is added in order to meet FCC.

SW-B5 No. 6 ~ No. 8 Reserved

Set to "0".

SW-B6 No. 1 ~ No. 5 DTMF signal transmission level (Low frequency 0 ~ 15.5dBm setting by 0.5dBm step)

The transmission level of DTMF signal is adjusted. (lower frequency)

00000: 0dBm

↓

11111: -15.5 dBm (-0.5dBm x 31)

SW-B6 No. 6 ~ No. 8 Reserved

Set to "0".

SW-B7 No. 1 ~ No. 5 DTMF signal transmission level (High frequency 0 ~ 15.5dBm setting by 0.5dBm step)

The transmission level of DTMF signal is adjusted. (higher frequency)

00000: 0dBm

↓

11111: -15.5 dBm (-0.5dBm x 31)

SW-B7 No. 6 ~ No. 8 Reserved

Set to "0".

SW-C1 No. 1, No. 2 Reading slice (Binary)

Used to determine the set value of reading density in standard/fine/super-fine mode.
The standard setting is "00"(Factory setting is "00").

SW-C1 No. 3, No. 4 Reading slice (Half tone)

Used to determine the set value of reading density in half tone mode.
The standard setting is "00"(Factory setting is "00").

SW-C1 No. 5 Line density selection

Used to set the transmission mode which is automatically selected when the Resolution key is not pressed. In the copy mode, however, the fine mode is automatically selected unless the Resolution key is manually set to another mode.

SW-C1 No. 6 Reserved

Set to "0".

SW-C1 No. 7 MTF correction in half tone mode

This allows selection of MTF correction (dimness correction) in the half tone mode.
When "NO" (=1) is selected, the whole image becomes soft and mild. Clearness of characters will be reduced. Normally set to "YES" (=0).

SW-C1 No. 8 Reserved

Set to "0".

SW-D1 No.1 ~ No. 4 Number of rings for auto receive (0 ~ 15rings setting)

When the machine is set in the auto receive mode, the number of rings before answering can be selected. It may be set from one to nine rings using a binary number. Since the facsimile telephone could be used as an ordinary telephone if the handset is taken off the hook, it should be programmed to the user's choice. If the soft switch was set to 1, direct connection is made to the facsimile.
If a facsimile calling beep was heard when the handset is taken off the hook, press the START key and put the handset on the hook to have the facsimile start receiving. If it was set to 0 accidentally, receive ring is set to 1.

NOTE: If the machine is set to answer after a large number of rings, it may not be able to receive faxes successfully.
If you have difficulty receiving faxes, reduce the number of rings to a maximum of 5.

SW-D1 No. 5 Automatic switching manual to auto receive function

This soft switch is used to select whether the machine should switch to the auto receive mode after 5 rings in the manual receive mode or remain in the same way as SW-D1 No. 1, No. 2, No. 3 and No. 4 "0"1"0"1"(5 rings).

SW-D1 No. 6, No. 7 CI detect frequency

Detection frequency of ring signal for auto reception is set.

When set to No. 6=0, No. 7=0, frequency is set to PTT recommendation.
When set to No. 6=0, No. 7=1, frequency is set to 11.5Hz or more.
When set to No. 6=1, No. 7=0, frequency is set to 13.0Hz or more.
When set to No. 6=1, No. 7=1, frequency is set to 20.0Hz or more.

SW-D1 No. 8 Reserved

Set to "0".

SW-D2 No. 1 ~ No. 5 Reserved

Set to "0".

SW-D2 No. 6 Caller ID Function

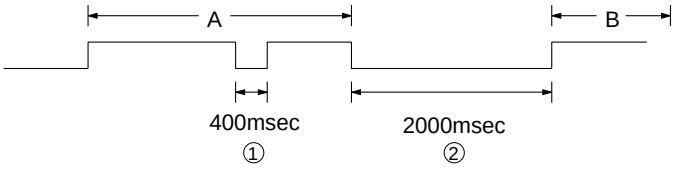
Used for Caller ID function.

SW-D2 No. 7, No. 8 Reserved

Set to "0".

SW-D3 No. 1 ~ No. 5 CI off detection timer (0 ~ 1550ms setting by 50ms step)

Set the minimum time period of CI signal interruption which affords to be judged as a CI OFF section with 50ms steps.
(Example)



0 1 1 1 0 (50ms~14) : 700ms(CI interruption>700ms:Judged as a CI OFF section)
The section 1 is not judged as a CI OFF section, the CI signal A is counted as one signal. The section 2 is judged as a CI OFF section, the CI signal B is considered as the second signal.

0 0 1 1 1 (50ms~7) : 350ms(CI interruption>350ms:J udged as a CI OFF section)
The section 1 is judged as a CI OFF section, and the CI signal A is counted as two signals. The section 2 is judged as a CI OFF section, and the CI signal B is considered as the third signal.

SW-D3 No. 6 ~ No. 8 Reserved

Set to "0".

SW-D4 No. 1 ~ No. 6 DTMF type Caller ID RX level (0 ~ -44dBm setting by 1dBm step)

This is used for DTMF type Caller ID detection level setting.

SW-D4 No. 7, No. 8 Reserved

Set to "0".

SW-E1 No. 1 ~ No. 3 Pseudo ringing time at the TEL/FAX automatic switching mode

Choice is made as to how long to rumble the dummy ringer on TEL/FAX automatic switching mode.

SW-E1 No. 4 Number of CNG signal detection at the TEL/FAX automatic switching mode

Used for detection of CNG in one tone or two tones in the TEL/FAX automatic switching mode.

SW-E1 No. 5 CNG detect period when TEL/FAX mode

The switch which sets the time from the start of CNG detection to the end of detection.

SW-E1 No. 6 Post answer tone (TEL/FAX mode)

When set to "0", machine send the tones in TEL/FAX auto changeover mode.

SW-E1 No. 7 Type of post answer tone

When set to "0", post answer tone is 800Hz single tone.
When set to "1", post answer tone is 880Hz/988Hz/1046Hz(LA-SI-DO) tone.

SW-E1 No. 8 Pseudo ringer ON/OFF cycle

When set to "0", pseudo ringer is 1 sec ON and 2 sec OFF cycles.
When set to "1", pseudo ringer is 1 sec ON and 4 sec OFF cycles.

SW-E2 No. 1 ~ No. 4 Pseudo ringer sound modem TX level (0 ~ -15dBm setting by 1dBm step)

Used to adjust the sound volume of pseudo ringer to the line (ring back tone) generated on selecting TEL/FAX.

SW-E2 No. 5 ~ No. 6 Post answer tone transmission level (0 ~ -15dBm setting by 1dBm step)

Used to adjust the sound volume of post answer tone to the line generated on selecting TEL/FAX.

SW-E3 No. 1 Disconnect the line when DTMF "#" is received during TEL/FAX automatic switching mode

When set to "1", if machine detects the DTMF code # during phone/fax automatic switching mode, stop the pseudo ringer and disconnect the line.
This effect when operator want to stop the pseudo ringer from extension phone connected with parallel.

SW-E3 No. 2 ~ No. 8 Reserved

Set to "0".

SW-F1 No. 1, No. 2 DTMF detection time

Used to set detect time of DTMF (Dual Tone Multi Frequency) used in remote reception(5 ✻ ✻).
The longer the detect time is, the less the error detection is caused by noises.

SW-F1 No. 3 Protection of remote reception (5 ✻ ✻) detection

Used to set the function of remote reception (5 ✻ ✻). When set to "1", the remote reception function is disabled.

SW-F1 No. 4 Remote reception with GE telephone

"1": Compatible with TEL mode by GE

"0": Not compatible

- When sending (5 ✻ ✻) for remote reception with a GE manufactured telephone remote reception may not take place because of special specifications in their DTMF.
  To overcome this, a soft SW is provided to change the modem setting to allow for remote reception.
- If this soft SW is set to "1", other telephone sets may be adversely affected.

SW-F1 No. 5 ~ No. 8 Remote operation code figure by external TEL (0~9)

Remote operation codes can be changed from 0 through 9. If set to greater than 9, it defaults to 9. The "5 ✻ ✻ " is not changed.
Ex- 7 ✻ ✻ (Default : 5 ✻ ✻)

SW-F2 No. 1 CNG detection in STAND-BY mode

When setting to "1", the CNG signal detection function during stand-by stops.

SW-F2 No. 2, No. 3 Number of CNG detect (AM mode)

Used for detection of CNG in 1 to 4 pulses.

SW-F2 No. 4, No. 5 Number of CNG detect (STAND-BY mode)

Used for detection of CNG in 1 to 4 pulses.

SW-F2 No. 6 ~ No. 8 Reserved

Set to "0"

SW-G1 No. 1 ~ No. 4 Quiet detect time (0 ~ 15sec setting by 1sec step)

When an answering machine is connected, if a no sound state is detected for a certain period of time, the machine judges it as a transmission from a facsimile machine and automatically switches to the FAX mode.

SW-G1 No. 5 ~ No. 8 Quiet detect start timing (0 ~ 15sec setting by 1sec step)

Inserts a pause before commencing quiet detection.

SW-G2 No. 1 ~ No. 8 Reserved

Set to "0"

SW-G3 No. 1, No. 2 OGM detect timer

This is used to change the OGM detection time for answering machine hook up detection.

SW-G3 No. 3, No. 4 Section time of quiet detection

The switch which sets the time from the start of detection function to the end of the function.

SW-G3 No. 5 ~ No. 8 Reserved

Set to "0"

SW-G4 No. 1 ~ No. 6 Quiet detect level setting (0 ~ -44dBm setting by 1dBm step)

This is used to change the quiet detect level setting.

If quiet detection is difficult due to noise, reduce this setting level.

(Example)

Factory setting : 1 0 1 1 0 0 (- 44dBm)

↓

1 0 1 0 0 0 (- 40dBm)

SW-G4 No. 7 Fax switching when A.M. full

If the answering machine's memory (tape) is full and there is no response, the machine automatically switches to Fax reception.

SW-G4 No. 8 Reserved

Set to "0".

SW-H1 No. 1 Busy tone continuous sound detect time

Set detecting time busy tone continuous sound for 5 seconds or 10 seconds.

SW-H1 No. 2 Reserved

Set to "0".

SW-H1 No. 3 Busy tone detect continuation sound detect

Used to select detection of the continuous sound of certain frequency.

SW-H1 No. 4 Reserved

Set to "0".

SW-H1 No. 5 Busy tone detect intermittent sound detect

Used to select detection of the intermittent sound of certain frequency.

SW-H1 No. 6, No. 7 Busy tone detection pulse number

Used to set detection of Busy tone intermittent sounds.

SW-H1 No. 8 Reserved

Set to "0".

SW-H2 No. 1, No. 2 Busy tone detection ON/OFF time (Lower duration)

The initial value of detection is set according to electric condition.

The set value is changed according to the local switch board. (Erroneous detection of sound is reduced.)

If erroneous detection is caused by sound, etc., adjust the detection range.

The lower limit can be set in the range of 150msec to 350msec.

SW-H2 No. 3, No. 4 Busy tone detection ON/OFF time (Upper duration)

Similarly to SW-H2 No. 1, No. 2, the set value can be varied.
The upper limit can be set in the range of 650msec to 2700msec.

SW-H2 No. 5 ~ No. 8 Reserved

Set to "0".

SW-I1 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I2 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I3 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I4 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I5 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I6 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I7 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I8 No. 1 ~ No. 8 Reserved

Set to "0".

SW-J1 No. 1 Sender's phone number setting

Used to make a choice of whether the registered sender's phone number can be changed or not. If the switch is set to "1", new registration of the sender's phone number is disabled to prevent accidental wrong input.

SW-J1 No. 2 Reserved

Set to "0".

SW-J1 No. 3, No. 4 Ringer Volume

Used to adjust ringing volume.

SW-J1 No. 5, No. 6 Speaker Volume

Used to adjust sound volume from a speaker.

SW-J1 No. 7 Polling key

If this switch is set to 1, the last of Rapid key works as polling key.

SW-J1 No. 8 Reserved

Set to "0".

SW-J2 No. 1 ~ No. 5 Reserved

Set to "0".

SW-J2 No. 6 Reserved

Set to "0".

SW-J2 No. 7, No. 8 Reserved

Set to "0".

SW-J3 No. 1 ~ No. 3 Communication results printout (Transaction report)

It is possible to obtain transaction results after each communication.
Normally,the switch is set (No. 1 : 0, No. 2 : 0, No. 3 : 0) so that the transaction report is produced only when a communication error is encountered.
If No.1 was set to 0 and No. 2 to 1 and No. 3 to 0, the transaction report will be produced every time a communication is done, even if the communication was successful.
Setting No. 1 to 0 and No. 2 to 1 and No. 3 to 1 will disable this function. No transaction report printed.

SW-J3 No. 4 Time format

When set to "0", 24hour time format is used.
When set to "1", 12hour time format is used.

SW-J3 No. 5 Date format

When set to "0", Day-Month-Year format is used.
When set to "1", Month-Day-Year format is used.

SW-J3 No. 6 ~ No. 8 Reserved

Set to "0".

SW-K1 No. 1 Entering diag mode by pressing SPEED key

A bit which is used in the production process only. When the SPEED key is pressed, the switch is changed from the stand-by state to the diag mode.

SW-K1 No. 2 ~ No. 8 Reserved

Set to "0".

[3] Troubleshooting

Refer to the following actions to troubleshoot any of the problems mentioned in 1-4.

[1] A communication error occurs.

[2] Image distortion produced.

[3] Unable to do overseas communication.

[4] Communication speed slow due to FALLBACK.

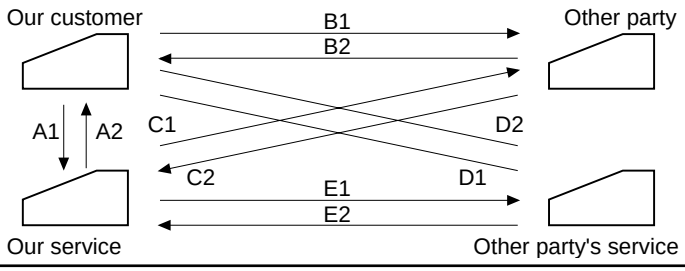
- Increase the transmission level SOFT SWITCH A4-1, 2, 3, 4, 5. May be used in case [1] [2] [3].
- Decrease the transmission level SOFT SWITCH A4-1, 2, 3, 4, 5. May be used in case [3].
- Apply line equalization SOFT SWITCH A5-1, 2. May be used in case [1] [2] [3] [4].
- Slow down the transmission speed SOFT SWITCH A2-1, 2, 3, 4. May be used in case [2] [3].
- Replace the TEL/LIU PWB. May be used in all cases.
- Replace the control PWB. May be used in all cases.

* If transmission problems still exist on the machine, use the following format and check the related matters.

TO: ATT: Ref.No. :
CC: ATT: Date :
FM: Dept :
Sign :

***** Facsimile communication problem *****			Ref.No.:
From: Mr.	Fax Tel No.:		Date:
Our customer	Name		Tel No.
	Address		Fax No.
	Contact person		Model name
Other party	Name		Tel No.
	Address		Fax No.
	Contact person		Model name
Problem mode	Line: Domestic / international	Model: G3	Phase: A, B, C, D.
	Reception / Transmission	Automatic reception / Manual reception	
		Automatic dialing / Manual dialing / Others	
Frequency:		%	ROM version:

Confirmation item



Please mark problem with an X.
No problem is: 0.

A1	A2	B1	B2	C1	C2	D1	D2	E1	E2

Transmission level setting is ( ) dB at our customer

Transmission level ( ) dBm
Reception level ( ) dBm
By level meter at B1 and B2

Comment

Countermeasure

**** Please attach the G3 data and activity report on problem. ****

* Please complete this report before calling the “TAC” hotline if problem still occurs.

[4] Error code table

1. Communication error code table

G3 Transmission

Code	Final received signal	Error Condition (Receiver side)
0	Incomplete signal frame	Cannot recognize bit stream after flag
1	NSF, DIS	Cannot recognize DCS signal by echo etc. Cannot recognize NSS signal (FIF code etc)
2	CFR	Disconnects line during reception (carrier missing etc)
3	FTT	Disconnects line by fall back
4	MCF	Disconnects line during reception of multi page Cannot recognize NSS, DCS signal in the case of mode change
5	PIP or PIN	The line is hung up without replying to telephone request from the receiving party.
6	RTN or RTP	Cannot recognize NSS, DCS signal after transmit RTN or RTP signal.
7	No signal or DCN	No response in receiver side or DCN signal received* (transmitter side)
8	--	Owing to error in some page the error could not be corrected although the specified number of error retransmissions were attempted.
11	--	Error occurred after or while reception by the remote (receiving) machine was revealed to be impossible.
12	--	Error occurred just after fallback.
13	--	Error occurred after a response to retransmission end command was received.

G3 Reception

Code	Final received signal	Error Condition (Receiver side)
0	Incomplete signal frame	Cannot recognize bit stream after flag
1	NSS, DCS	Cannot recognize CFR or FTT signal Disconnects line during transmission (line error)
2	NSC, DTC	Cannot recognize NSS signal (FIF code etc)
3	EOP	Cannot recognize MCF, PIP, PIN, RTN, RTP signal
4	EOM	Cannot recognize MCF, PIP, PIN, RTN, RTP signal in the case of mode change
5	MPS	The line is hung up without replying to communication request.
6	PR1-Q	Cannot recognize PIP, PIN signal in the case of TALK request
7	No signal or DCN	No response in transmitter (cannot recognize DIS signal) or DCN signal received* (receiver side)
8	--	Error occurred upon completion of reception of all pages.
9	--	Error occurred when mode was changed or Transmission/Reception switching was performed.
10	--	Error occurred during partial page or physical page reception.
11	--	Error occurred after or during inquiry from the remote (transmitting) machine as to whether reception is possible or not.
12	--	Error occurred during or just after fallback.
13	--	Error occurred after the retransmission end command was received.

CHAPTER 3. MECHANISM BLOCKS

[1] General description

1. Document feed block and diagram

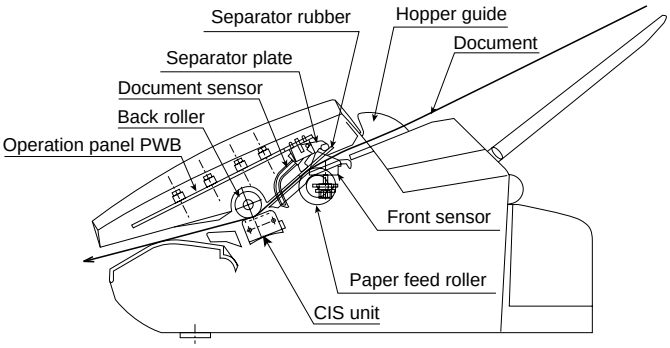


Fig. 1

2. Document feed operation

1) The original, which is set in the document hopper, feeds automatically when the front sensor is activated. This in turn activates the pulse motor which drives the document supply roller. The document stops when the lead edge is detected by the document sensor.
2) The lead edge of the original is fed a specified number of pulses after the lead edge of the document is detected for the reading process to begin.
3) The trailing edge of the original is fed a specific number of pulses after the trailing edge of the document deactivates the document sensor. The read process then stops and the original is discharged.
4) When the front sensor is in the OFF state (any document is not set up in the hopper guide), the drive will be stopped when the document is discharged.

3. Hopper mechanism

3-1. General view

Fig. 2

The hopper section contains document guides that are used to adjust the hopper to the width of the original document. This ensures that the original feeds straight into the fax machine for scanning.
Document width: 148 mm to 216 mm (A5 longitudinal size to Letter longitudinal size)
NOTE: Adjust the document guide after setting up the document.

3-2. Automatic document feed

1) Use of the paper feed roller and separation rubber plate ensures error-free transport and separation of documents. The plate spring presses the document to the paper feed roller to assure smooth feeding of the document.
2) Document separation method: Separation rubber plate

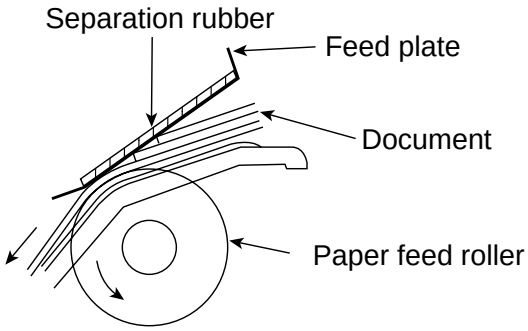


Fig. 3

3-3. Documents applicable for automatic feed

	4x6 series (788mm x 1091mm x 1000mm sheets)		Square meter series	
	Minimum	Maximum	Minimum	Maximum
Feeder capacity	10 sheets, max.			
Paper weight	45kg	69.2kg	52g/m^2	80g/m^2
Paper thickness (ref.)	0.06mm	0.09mm	0.06mm	0.09mm
Paper size	148mm x 140mm ~ A4 (210mm x 297mm), Letter (216mm x 279mm)			

NOTE: Double-side coated documents and documents on facsimile recording paper should be inserted manually. The document feed quantity may be changed according to the document thickness.

Documents corresponding to a paper weight heavier than 69.2kg (80g/m^2) and lighter than 135kg (157g/m^2) are acceptable for manual feed.

Documents heavier than 135kg in terms of the paper weight must be duplicated on a copier to make it operative in the facsimile.

3-4. Loading the documents

1) Make sure that the documents are of suitable size and thickness, and free from creases, folds, curls, wet glue, wet ink, clips, staples and pins.
2) Place documents face down in the hopper.
   i) Adjust the document guides to the document size.
   ii) Align the top edge of documents and gently place them into the hopper. The first page under the stack will be taken up by the feed roller to get ready for transmission.

NOTES: 1) Curled edge of documents, if any, must be straightened out.
2) Do not load the documents of different sizes and/or thicknesses together.

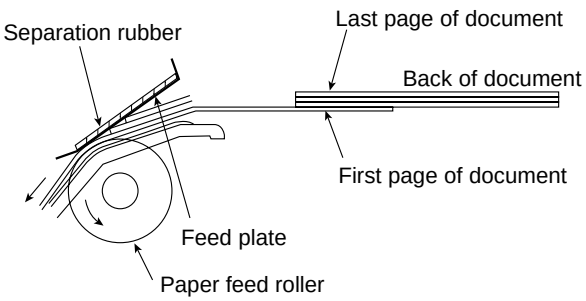


Fig. 4

3-5. Documents requiring use of document carrier

1) Documents smaller than 148mm x 140mm.
2) Documents thinner than the thickness of 0.06mm.
3) Documents containing creases, folds, or curls, especially those whose surface is curled (maximum allowable curl is 5mm).
4) Documents containing tears.
5) Carbon-backed documents. (Insert a white sheet of paper between the carbon back and the document carrier to avoid transfer of carbon to the carrier.)
6) Documents containing an easily separable writing material (e.g., those written with a lead pencil).
7) Transparent documents.
8) Folded or glued documents.

Document in document carrier should be inserted manually into the feeder.

4. Document release

4-1. General

To correct a jammed document or to clean the document running surface, pull the insertion side of document center of the operation panel. To open the upper document guide, the operation panel must be opened first.

4-2. Cross section view

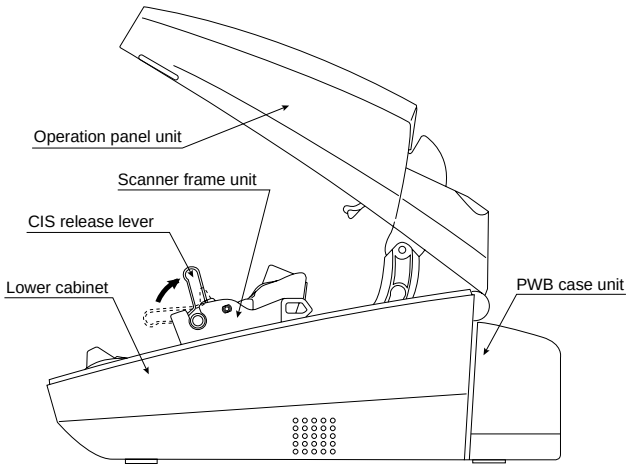


Fig. 5

5. Recording block

5-1. General view

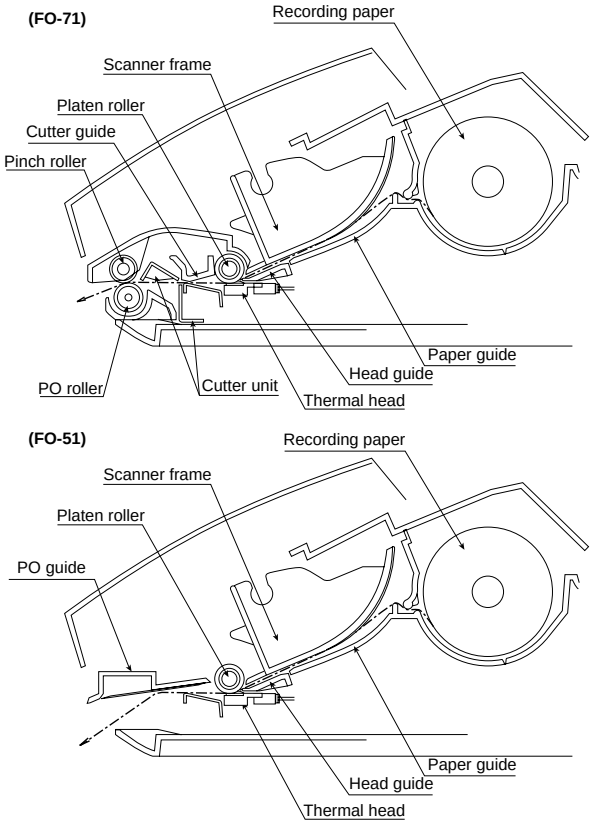


Fig. 6

5-2. Driving

Via the pulse motor gear shaft, the reduction gear, and the recording paper feed gear, rotation of the pulse motor is conveyed to the recording paper feed roller to feed the recording paper.

5-3. Recording

Use of a thermal head permits easier maintenance and low operating costs.

1) Thermal head

The thermal head consists of 1728-dot heat elements arranged in a single row and has the resolution of 8 dots/mm. The maximum recording speed is 10ms/line. The thermal head also incorporates a 1728-dot shift register latch and output control driver circuit. Low power consumption is achieved by dividing the head into nine segments.

2) Structure of the recording mechanism

Recording is accomplished by pressing the thermal head on the recording paper against the platen roller.

The main scan (horizontal) is electronically achieved, while the subscan (vertical) is achieved by moving the recording paper by the recording platen roller.

Usually, the cause for uneven print tone is caused by misalignment of the thermal head or uneven contact with the roller.

It can by checked in the following manner.

1) Check if the thermal head power and signal cables are properly routed.
2) Check that the thermal head pivot moves smoothly up and down.
3) Check that the thermal head support bracket is secured without any play.
4) Check to see that the recording platen roller has proper concentricity, in the case of a print tone variation evenly repeated down the page.
5) Replace the thermal head with a new one and check to see if the same trouble occurs.

[2] Disassembly and assembly procedures

- This chapter mainly describes the disassembly procedures. For the assembly procedures, reverse the disassembly procedures.
- Easy and simple disassembly/assembly procedures of some parts and units are omitted. For disassembly and assembly of such parts and units, refer to the Parts List.
- The numbers in the illustration, the parts list and the flowchart in a same section are common to each other.
- To assure reliability of the product, the disassembly and the assembly procedures should be performed carefully and deliberately.

1 Paper support guide, handset cover and scanner unit

Parts list (Fig. 1)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	7	Screw (3×8)	1
2	Screw (3×12)	2	8	Handset cover	1
3	Paper support guide	1	9	Hook switch lever	1
4	Paper sensor lever	1	10	Screw (3×12)	2
5	Paper sensor lever spring	1	11	Connector	2
6	Panel stopper	1	12	Scanner unit	1

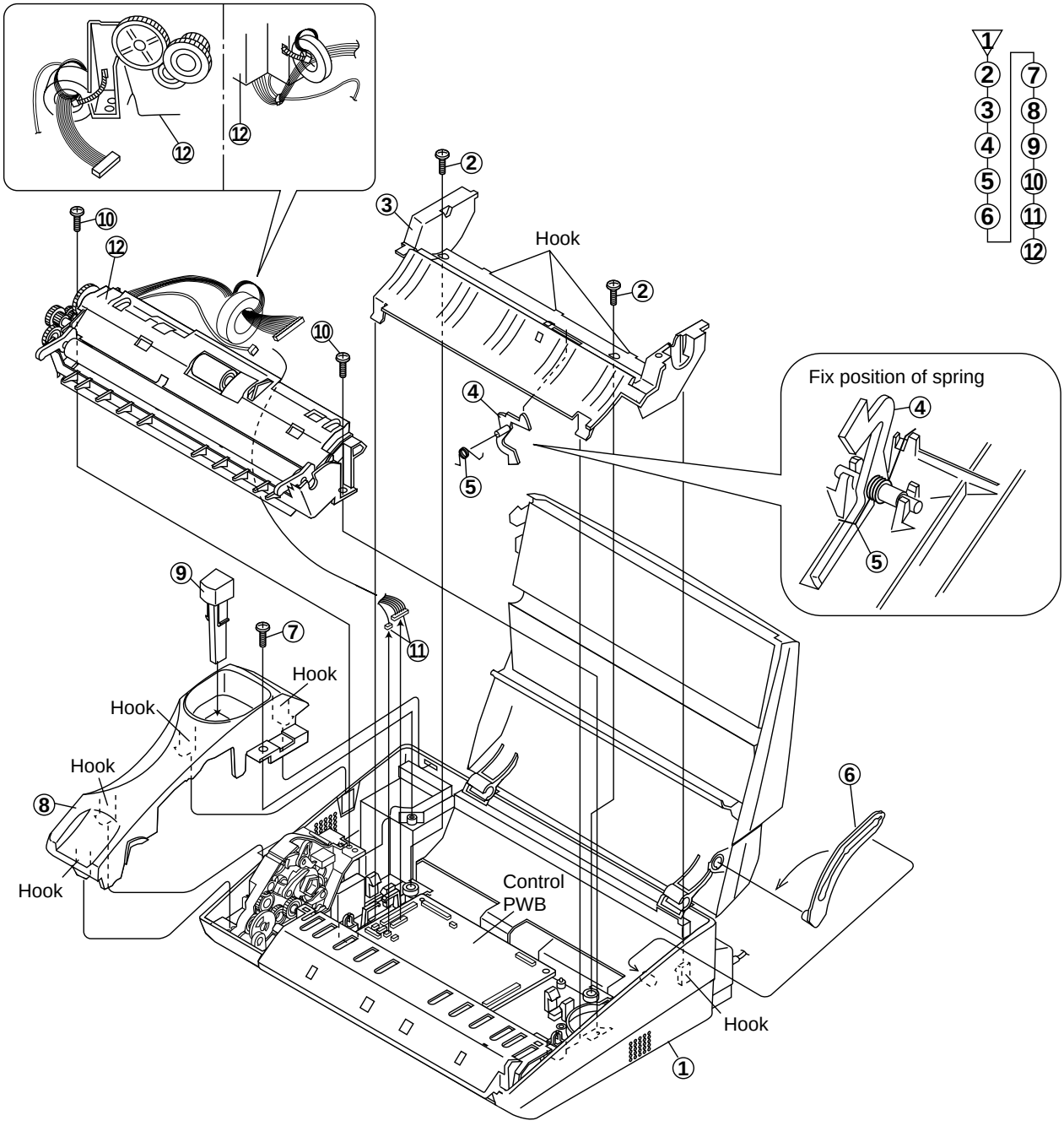


Fig. 1

2 CIS unit and scanner frame

Parts list (Fig. 2)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Document guide lower	1	10	Feed roller shaft	1
2	Back roller gear	1	11	Feed roller	1
3	Back roller bearing, left	1	12	Connector	1
4	CIS release lever, left	1	13	CIS support, left	1
5	Back roller	1	14	CIS support, right	1
6	CIS release lever, right	1	15	CIS unit	1
7	Back roller bearing, right	1	16	CIS spring	2
8	Reduction gear, 17/28z	1	17	Connector	1
9	Reduction gear, 17/23z	1	18	Front sensor	1
			19	Scanner frame	1

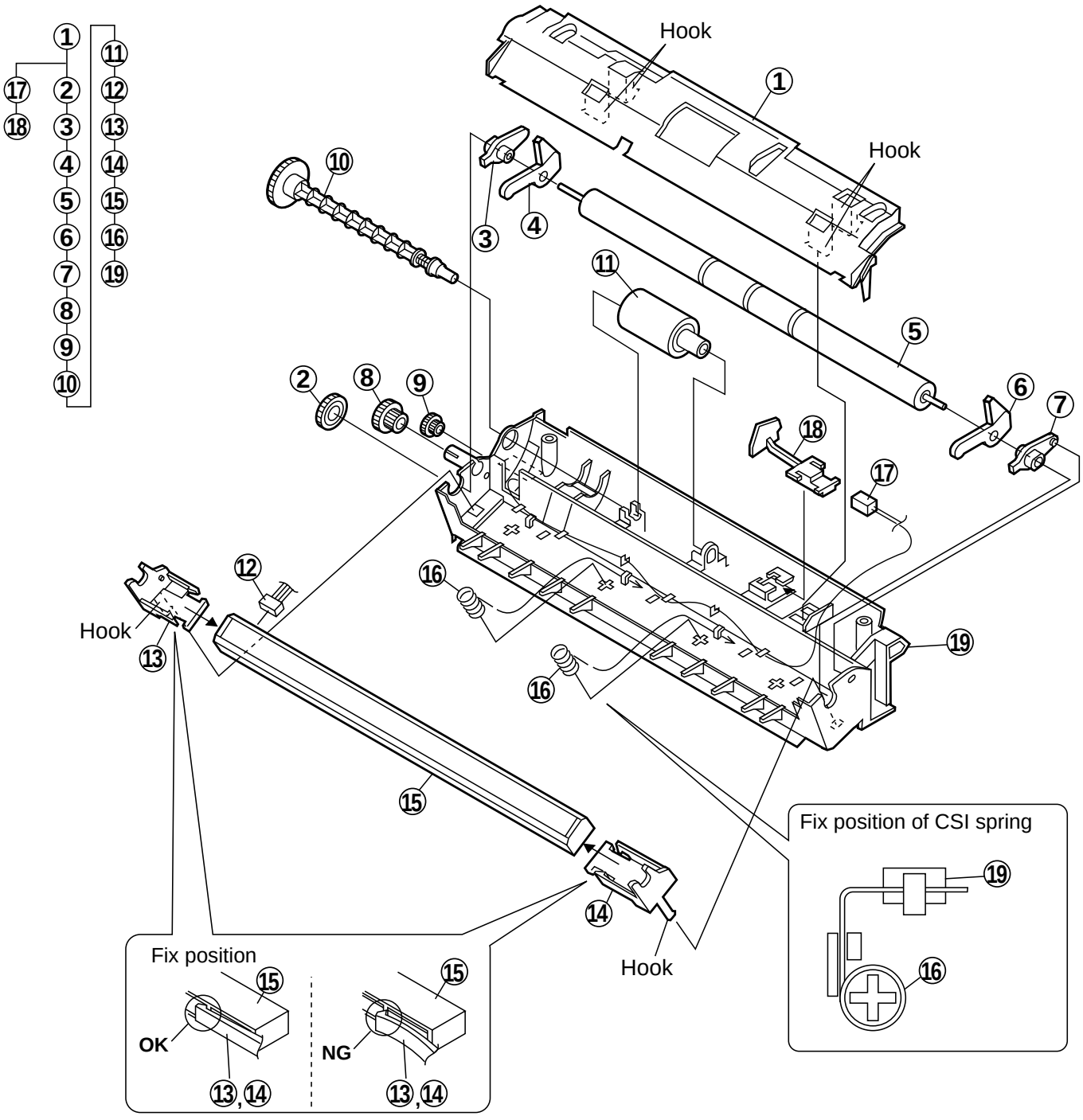


Fig. 2

3 Operation panel unit, drive unit, hopper guide

Parts list (Fig. 3)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	10	Screw (3×10)	2
2	Connector	2	11	Hopper guide unit	1
3	Operation panel unit	1	12	Operation panel unit/ document guide upper unit	1
4	Connector (FO-71)	3			
4	Connector (FO-51)	2	13	Screw	1
5	Screw (3×8) (FO-71 only)	1	14	Pinion gear	1
6	Cutter cam spring (FO-71 only)	1	15	Hopper spring	1
			16	Hopper guide, left	1
7	Screw (3×10)	1	17	Hopper guide, right	1
8	Drive unit	1	18	Hopper guide	1
9	Cutter arm (FO-71 only)	1			

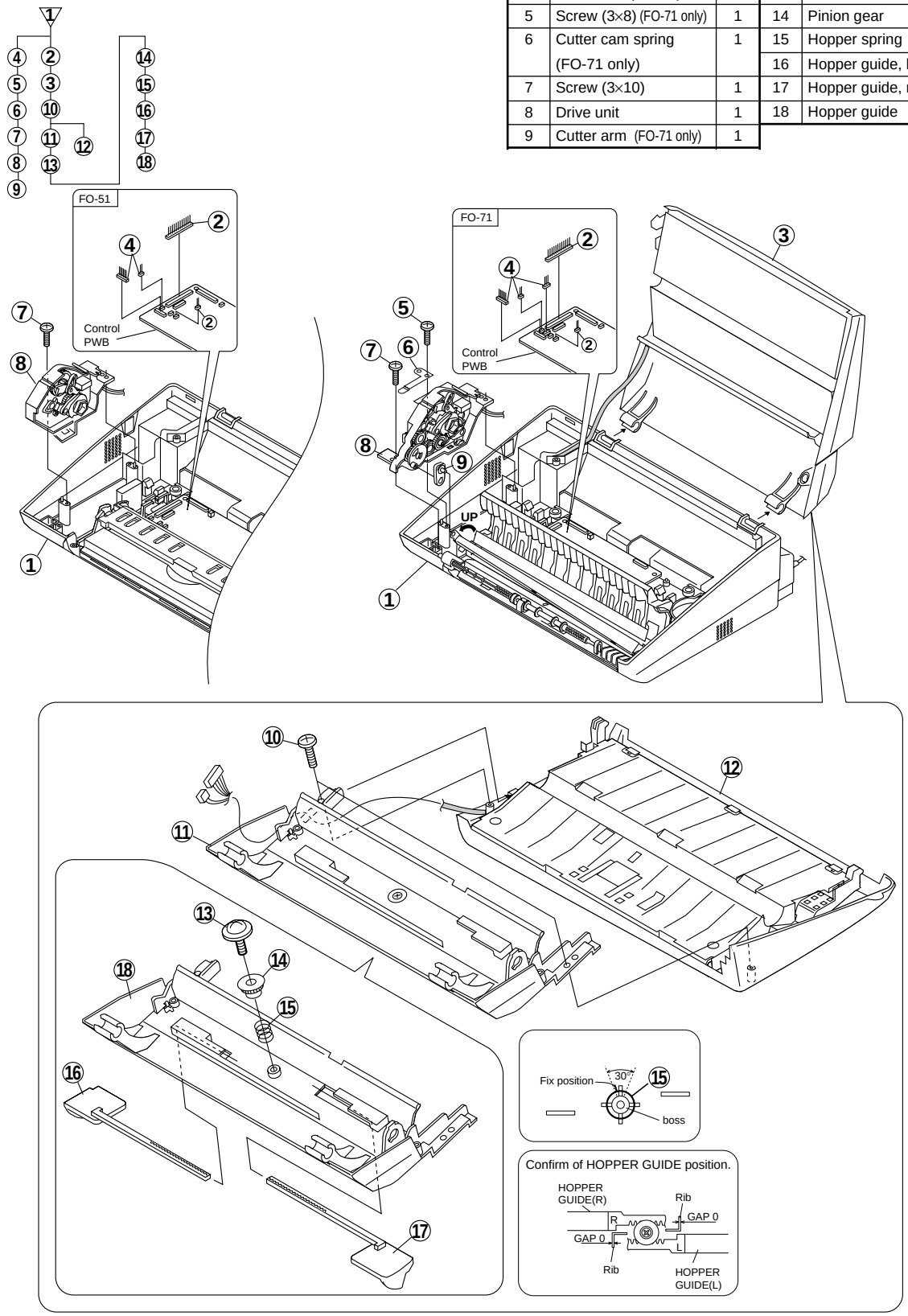


Fig. 3

4 Upper cabinet and document guide upper

Parts list (Fig. 4)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Screw (3×10)	2	11	Feed plate	1
2	Connector	1	12	Document guide upper	1
3	Door sensor	1	13	Screw (2×6)	3
4	Blind sheet	1	14	Connector	1
5	Document guide upper unit	1	15	Operation panel PWB unit	1
6	Operation panel unit	1	16	Direct key	1
7	Separate spring	1	17	Start key	1
8	Separator plate	1	18	12 key	1
9	Separator rubber	1	19	Upper cabinet	1
10	Feed spring	1			

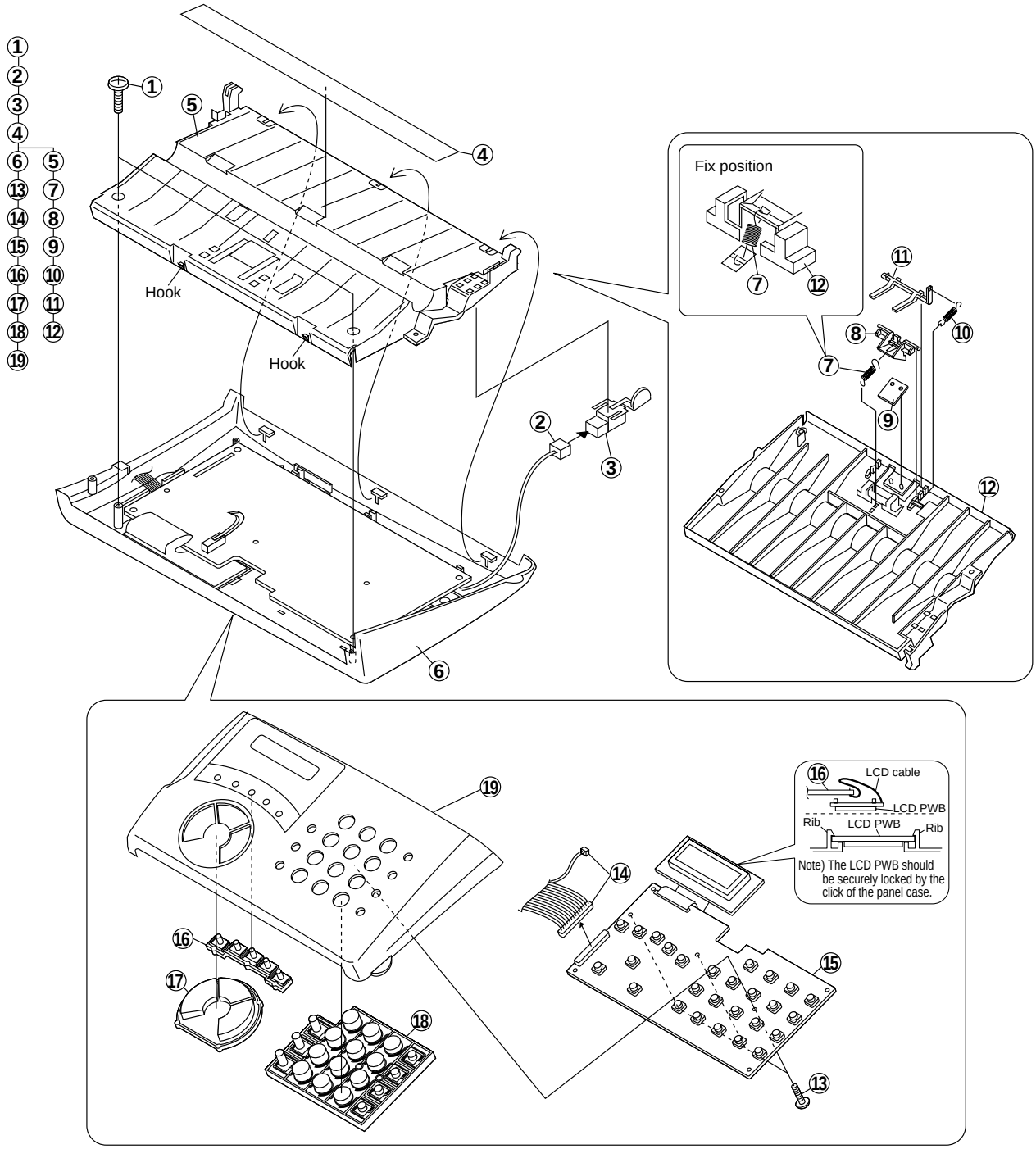


Fig. 4

5 Drive unit frame (Cutter model)

Parts list (Fig. 5)

No.	Part name	Q'ty	No.	Part name	Q'ty	No.	Part name	Q'ty
1	Cutter switch	1	11	Idler gear, 25Z	1	21	Planet gear	1
2	Cutter gear	1	12	Planet lever C	1	22	Planet gear spring	1
3	Cutter gear spring	1	13	Planet gear	1	23	Planet lever B	1
4	Cutter plate	1	14	Planet gear spring	1	24	Planet gear	1
5	Cam spring	1	15	Reduction gear, 17/36Z	1	25	Planet gear spring	1
6	Cam switch	1	16	Mode lever	1	26	Reduction gear, 17/43Z	1
7	Cam gear	1	17	Planet gear	1	27	Idler gear, 25Z	1
8	Reduction gear, 17/30Z	1	18	Planet gear spring	1	28	Screw (3×10)	1
9	Idler gear, 30Z	1	19	Reduction gear, 17/30Z	1	29	Motor	1
10	Idler gear, 25Z	1	20	Planet lever A	1	30	Motor plate	1
						31	Drive unit frame	1

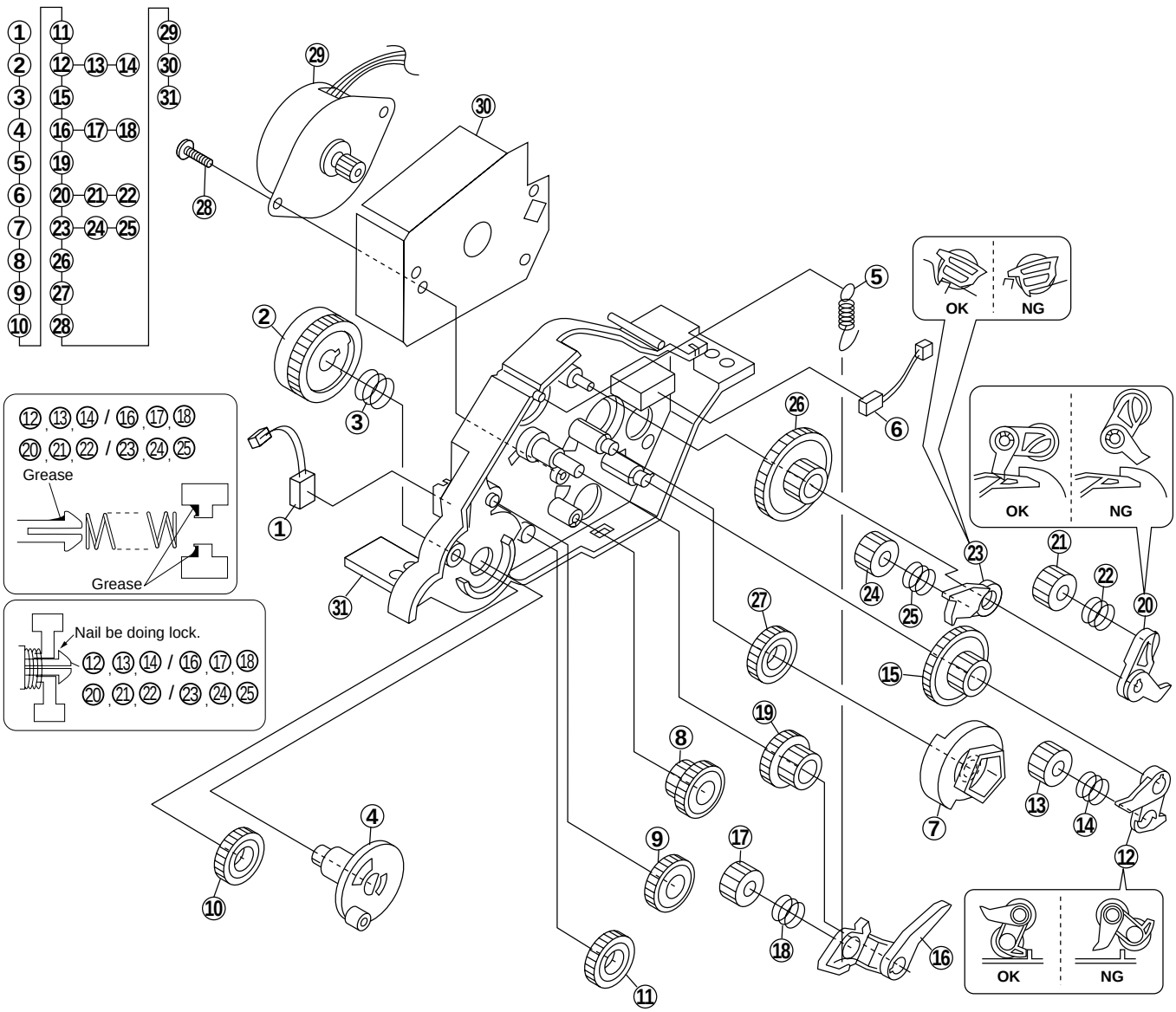


Fig. 5

6 Drive unit frame (Non cutter model)

Parts list (Fig. 6)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Cam spring	1	10	Planet lever B	1
2	Cam switch	1	11	Planet gear	1
3	Cam gear	1	12	Planet gear spring	1
4	Mode lever	1	13	Reduction gear, 17/30Z	1
5	Planet gear	1	14	Reduction gear, 17/43Z	1
6	Planet gear spring	1	15	Idler gear, 25Z	1
7	Planet lever A	1	16	Screw (3×10)	1
8	Planet gear	1	17	Motor	1
9	Planet gear spring	1	18	Motor plate	1
			19	Drive unit frame	1

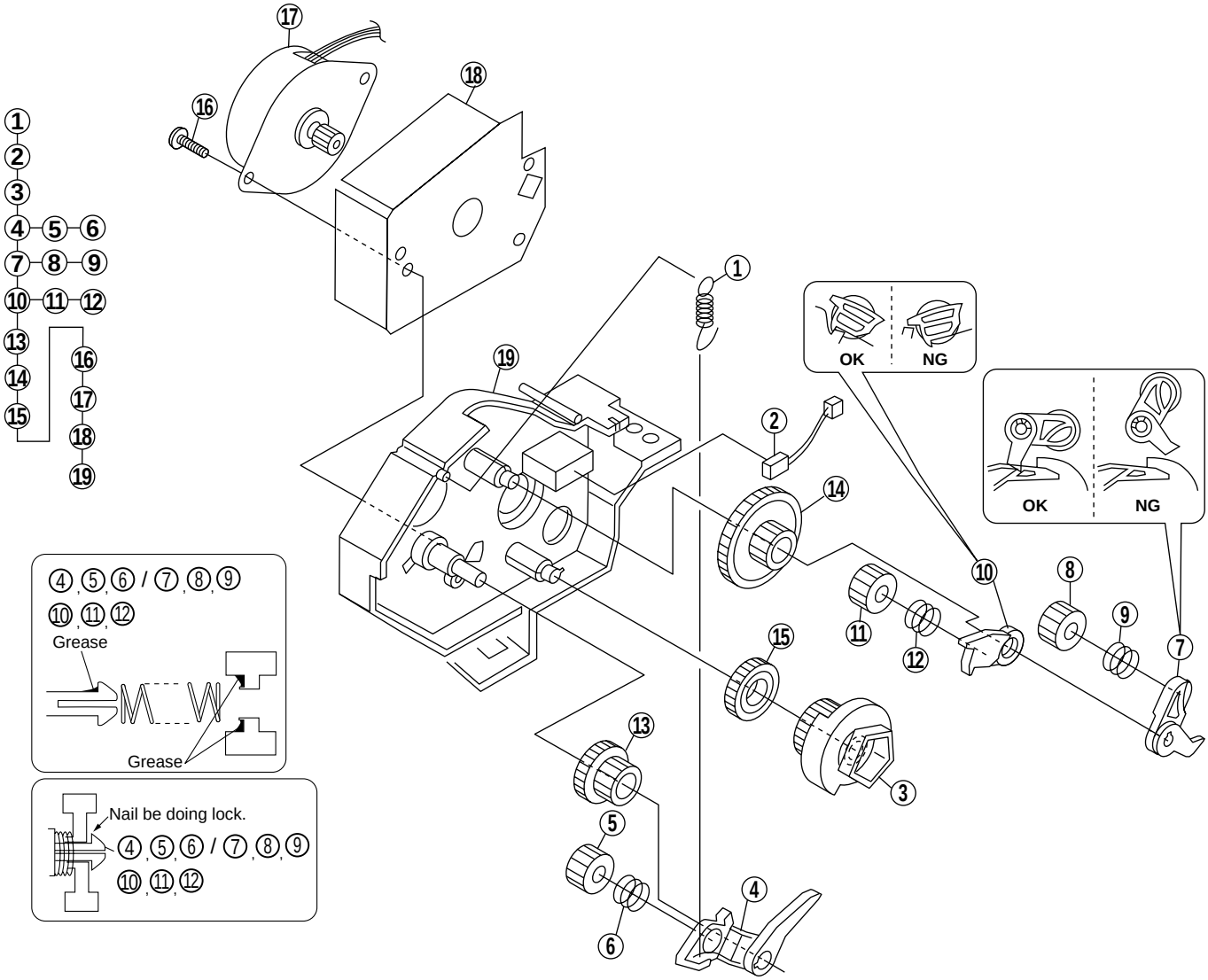


Fig. 6

7 Head guide, PO guide, cutter guide upper and cutter

Parts list (Fig. 7)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	7	Screw (3×8) (FO-51 only)	1
2	Cutter guide upper (FO-71 only)	1	8	PO guide (FO-51 only)	1
			9	Release lever (FO-51 only)	1
3	PO guide unit (FO-71 only)	1	10	Head guide	1
4	Pinch roller spring (FO-71 only)	2	11	Screw (3×6) (FO-71 only)	1
5	Pinch roller (FO-71 only)	2	12	Cutter cushion (FO-71 only)	1
6	PO guide (FO-71 only)	1	13	Cutter (FO-71 only)	1

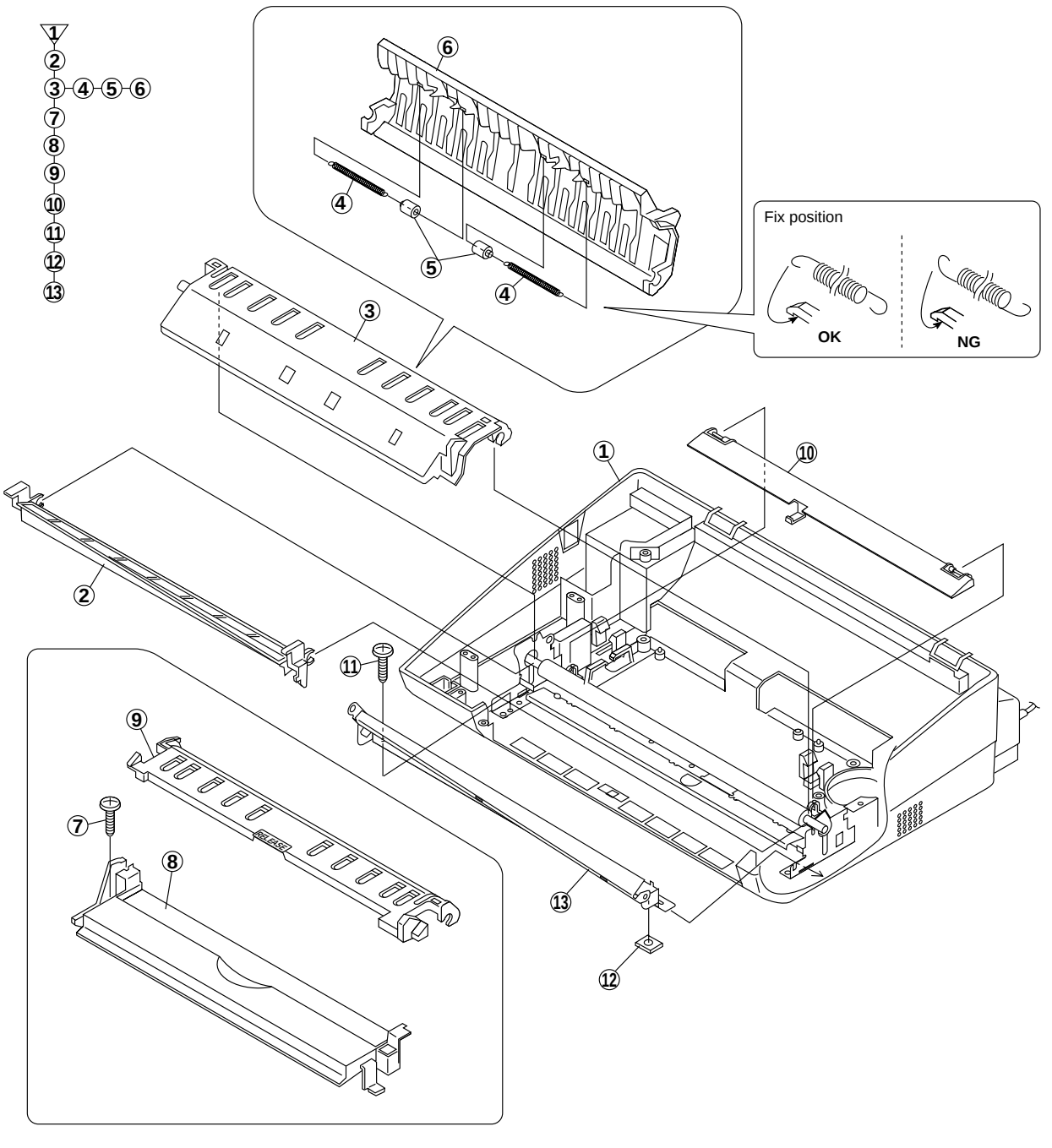


Fig. 7

8 PO roller guide and head frame unit

Parts list (Fig. 8)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	7	PO roller ass'y (FO-71 only)	1
2	Screw (3×6)	1	8	PO roller guide (FO-71 only)	1
3	Connector	1	9	Screw (3×10)	1
4	Screw (3×8) (FO-71 only)	1	10	Earth plate	1
			11	Head earth cable	1
5	PO roller guide unit (FO-71 only)	1	12	Head frame unit	1
			13	Screw (3×8)	2
6	PO gear (FO-71 only)	1	14	Panel lock lever spring	2

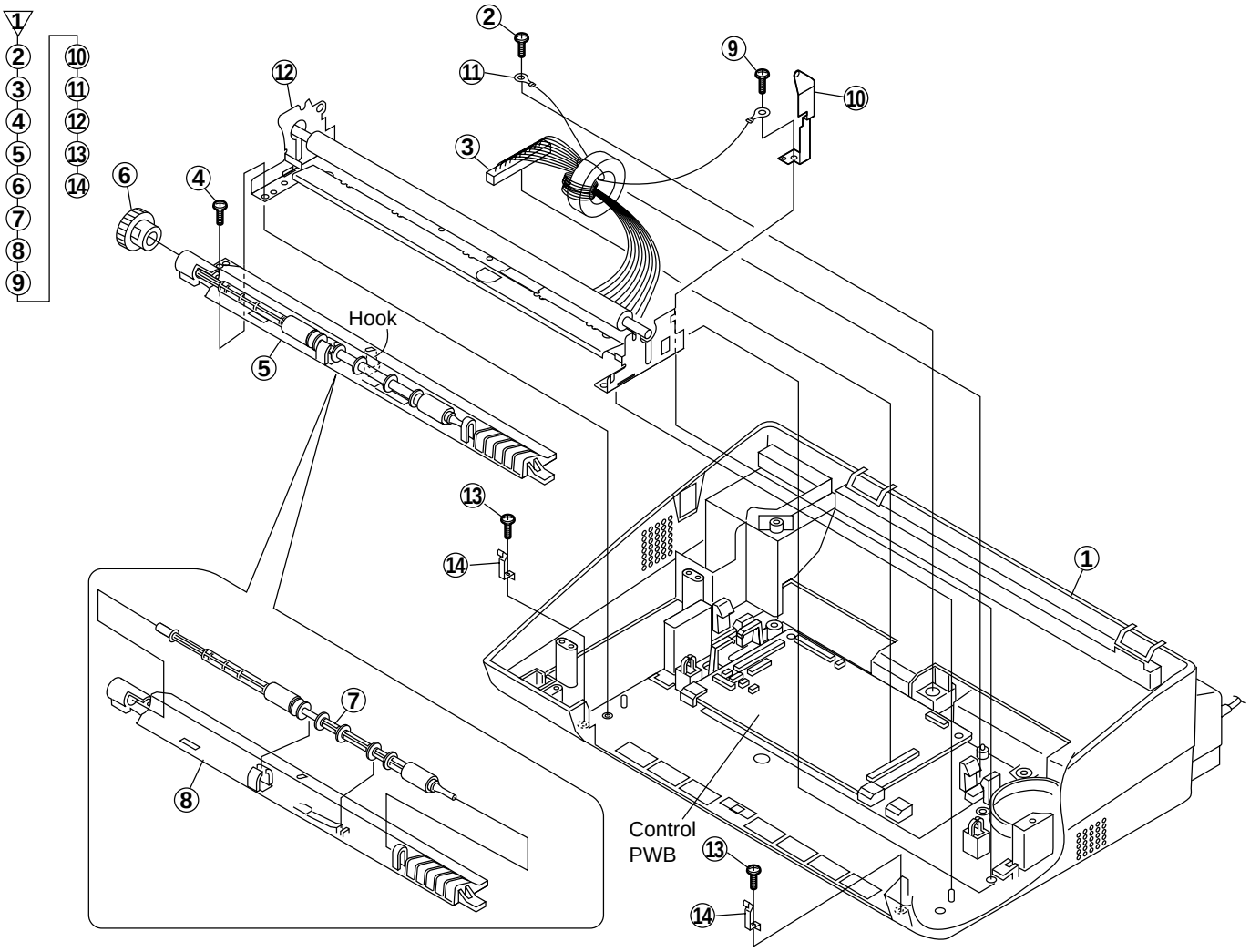


Fig. 8

9 Head frame and thermal head

Parts list (Fig. 9)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Platen gear	1	9	Thermal head	1
2	Platen bearing	2	10	Document sensor lever (FO-71 only)	1
3	Platen roller	1			
4	Connector	1	11	Document sensor lever spring (FO-71 only)	1
5	Screw (3×6)	1			
6	Head holder, left	1	12	Head spring 2	2
7	Screw (3×6)	1	13	Head spring 1	3
8	Head holder, right	1	14	Head frame	1

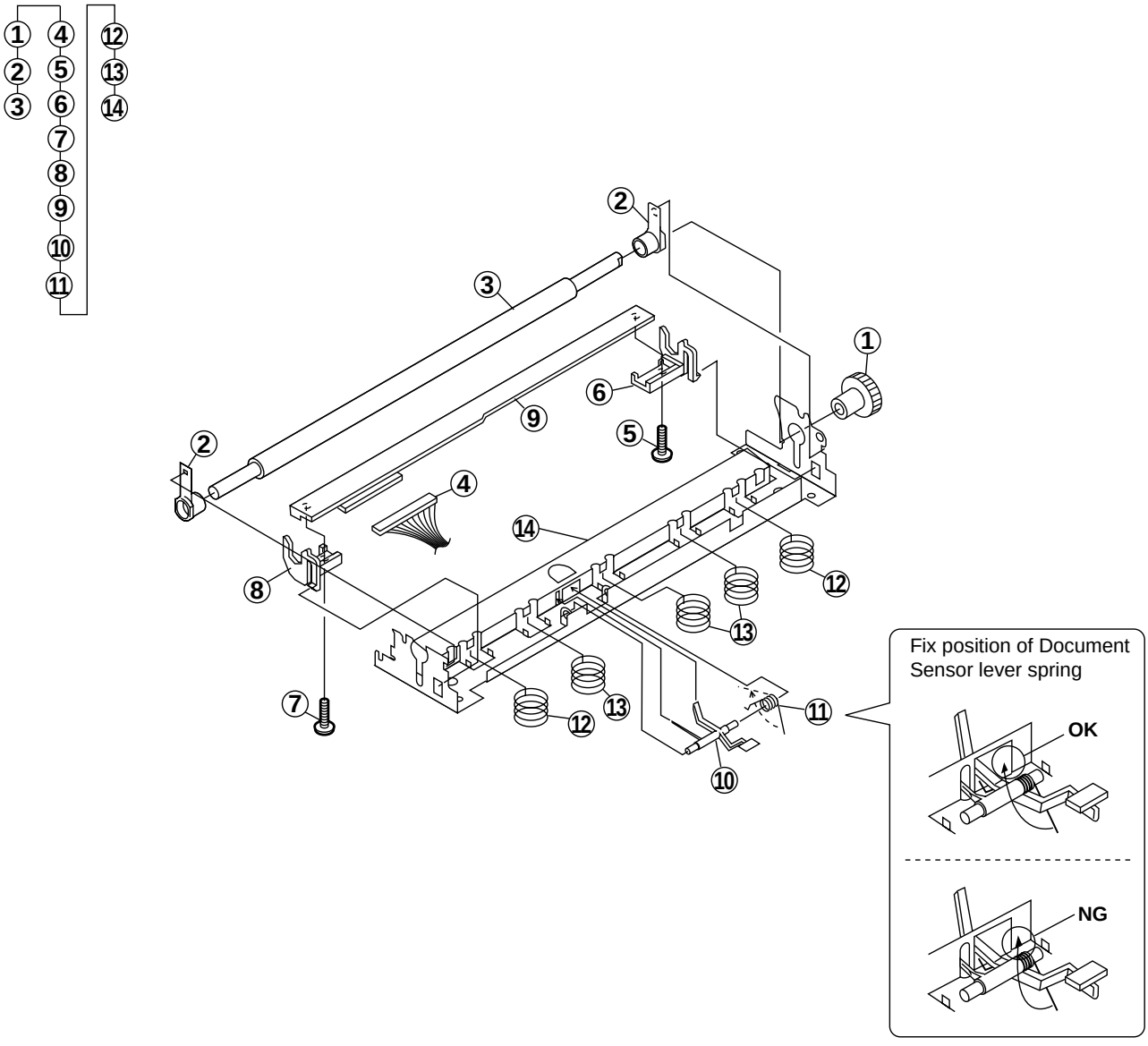


Fig. 9

10 PWB case top, bottom, PWB and speaker

Parts list (Fig. 10)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	11	Screw (3×10)	2
2	Screw (3×10)	1	12	Hook switch joint lever	1
3	Connector	1	13	PWB case, top	1
4	Connector	2	14	PWB case, bottom unit	1
5	PWB case unit	1	15	Screw (3×6)	1
6	Screw (3×8)	1	16	TEL/LIU PWB unit	1
7	Control PWB unit	1	17	Screw (4×6)	1
8	Screw (3×8)	1	18	AC cord ass'y	1
9	Speaker holder lever spring	1	19	Power supply PWB unit	1
10	Speaker ass'y	1	20	PWB case, bottom	1

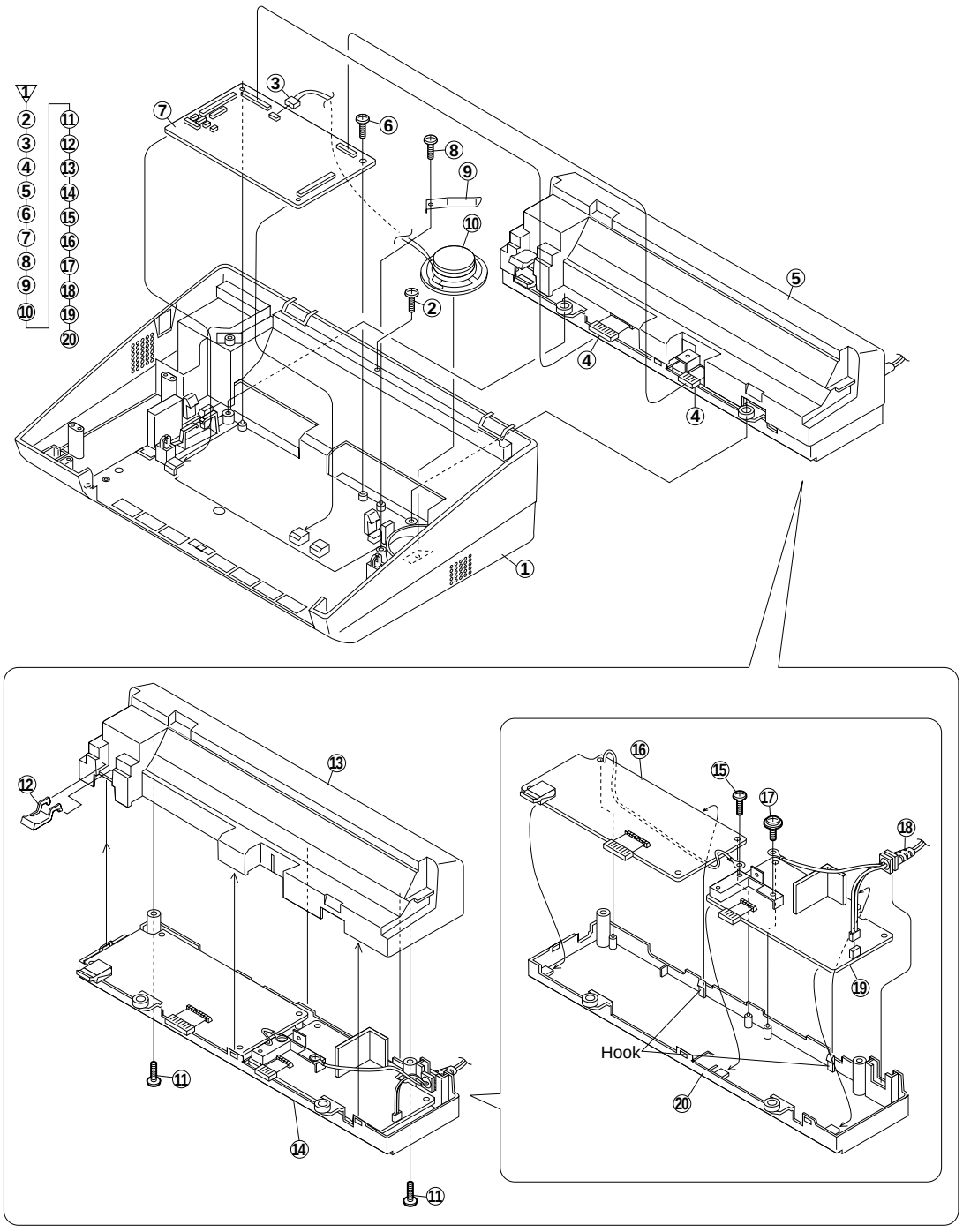


Fig. 10

11 Wire treatment

Parts list (Fig. 11)

No.	Part name	Q'ty
1	Core (F2125)	2
2	Screw (3×6)	1
3	Screw (4×6)	1
4	Screw (3×6)	1
5	Band (100mm)	3
6	Core (F2123)	1
7	Screw (3×10)	1

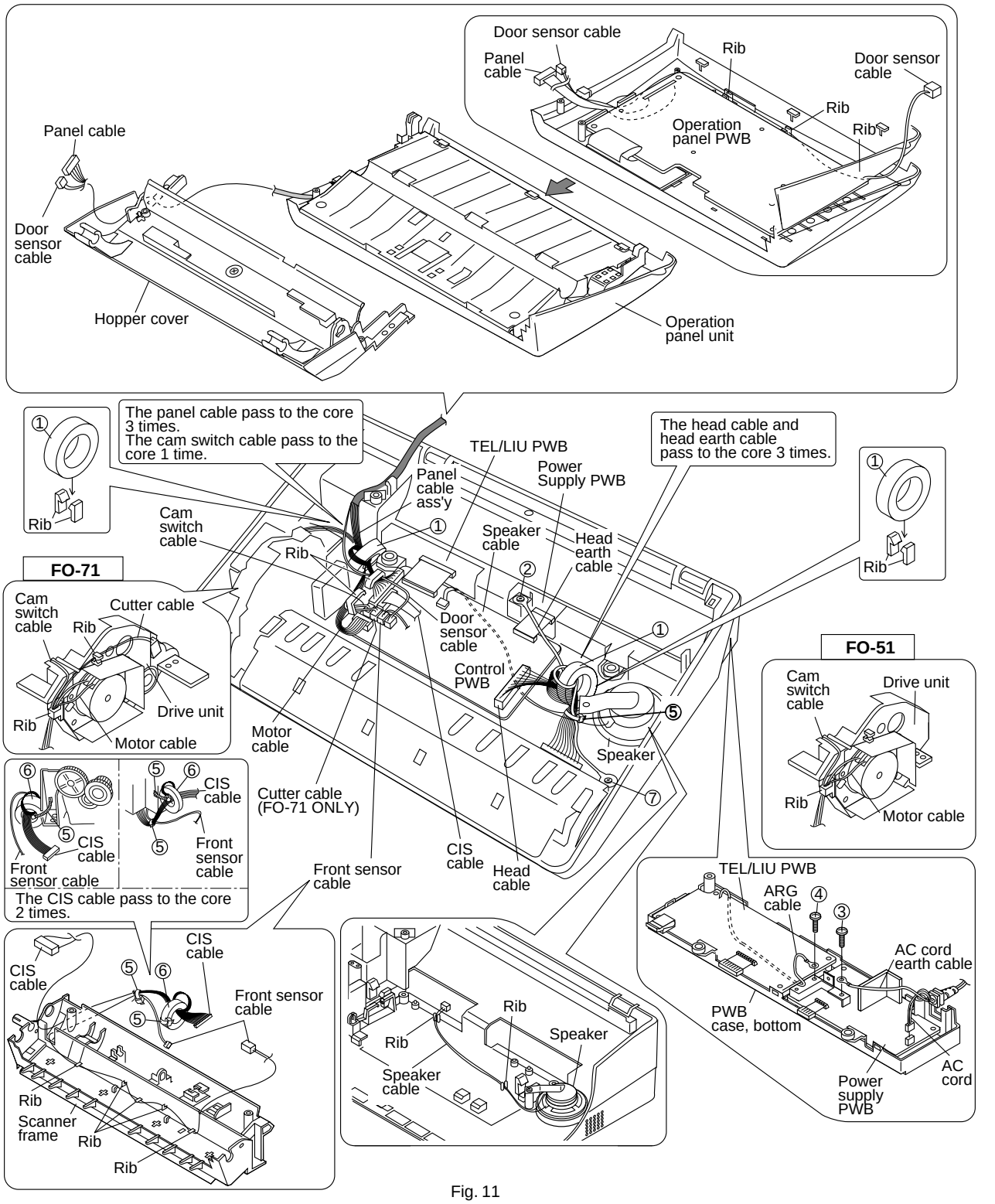
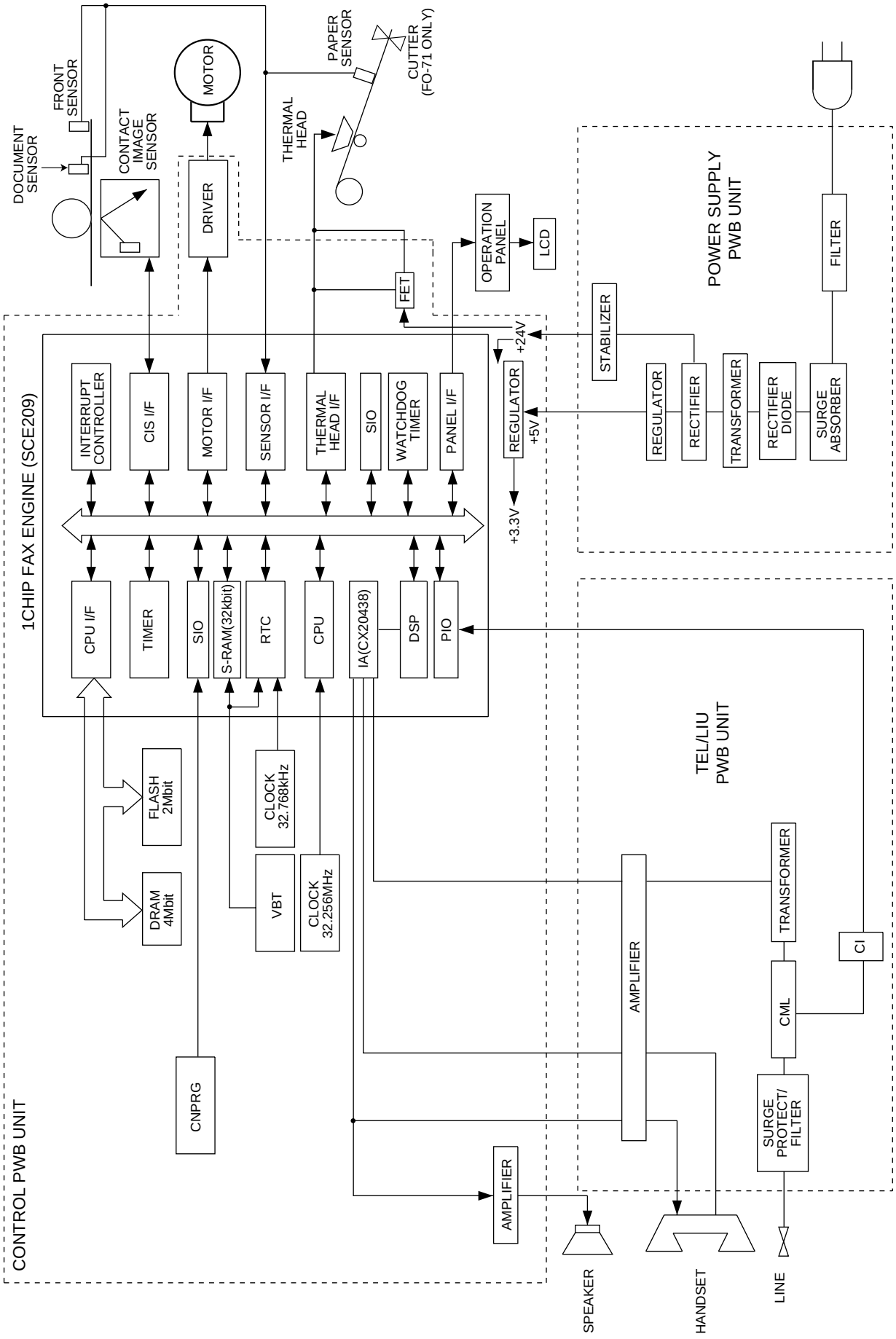


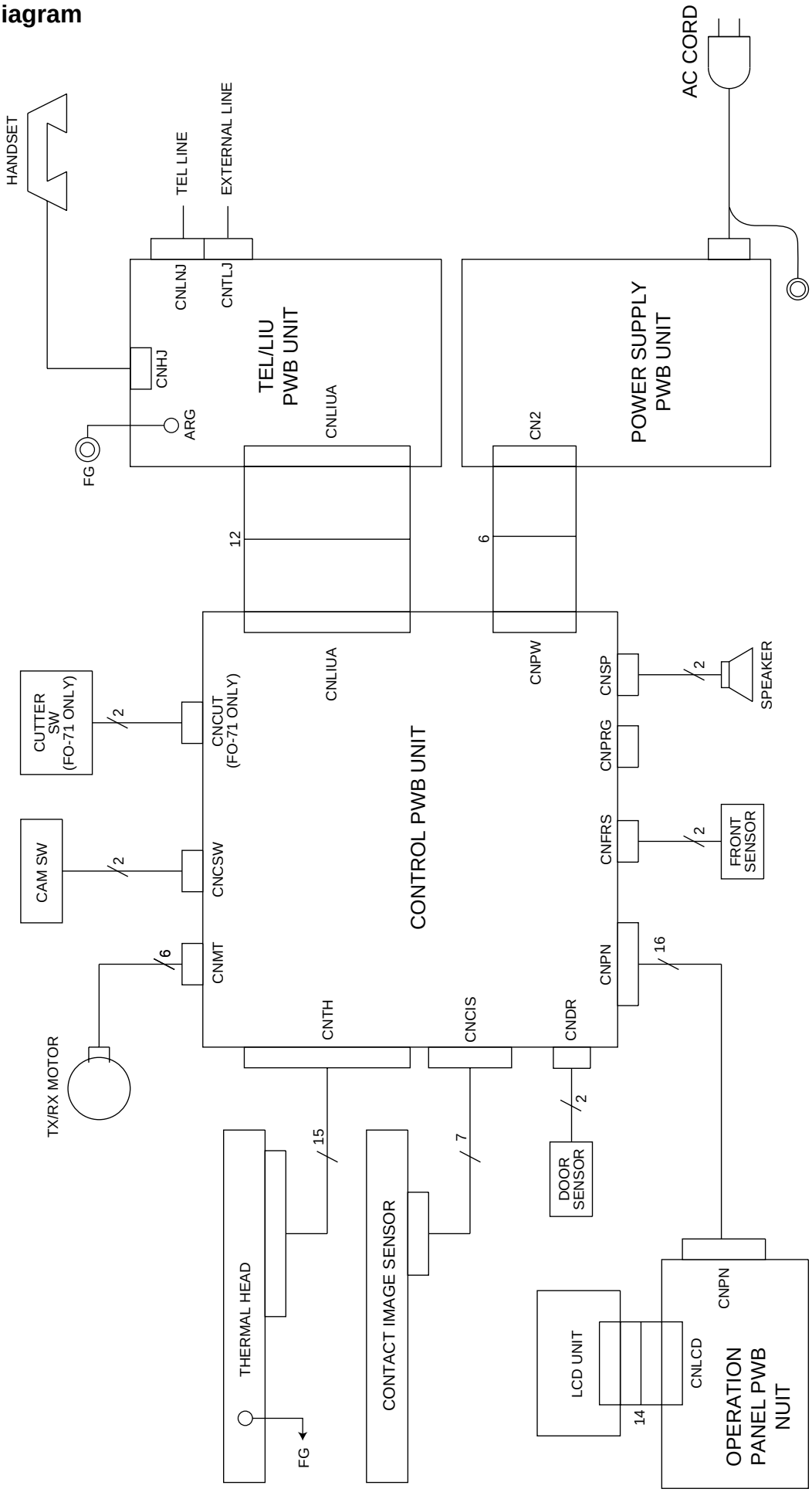
Fig. 11

CHAPTER 4. DIAGRAMS

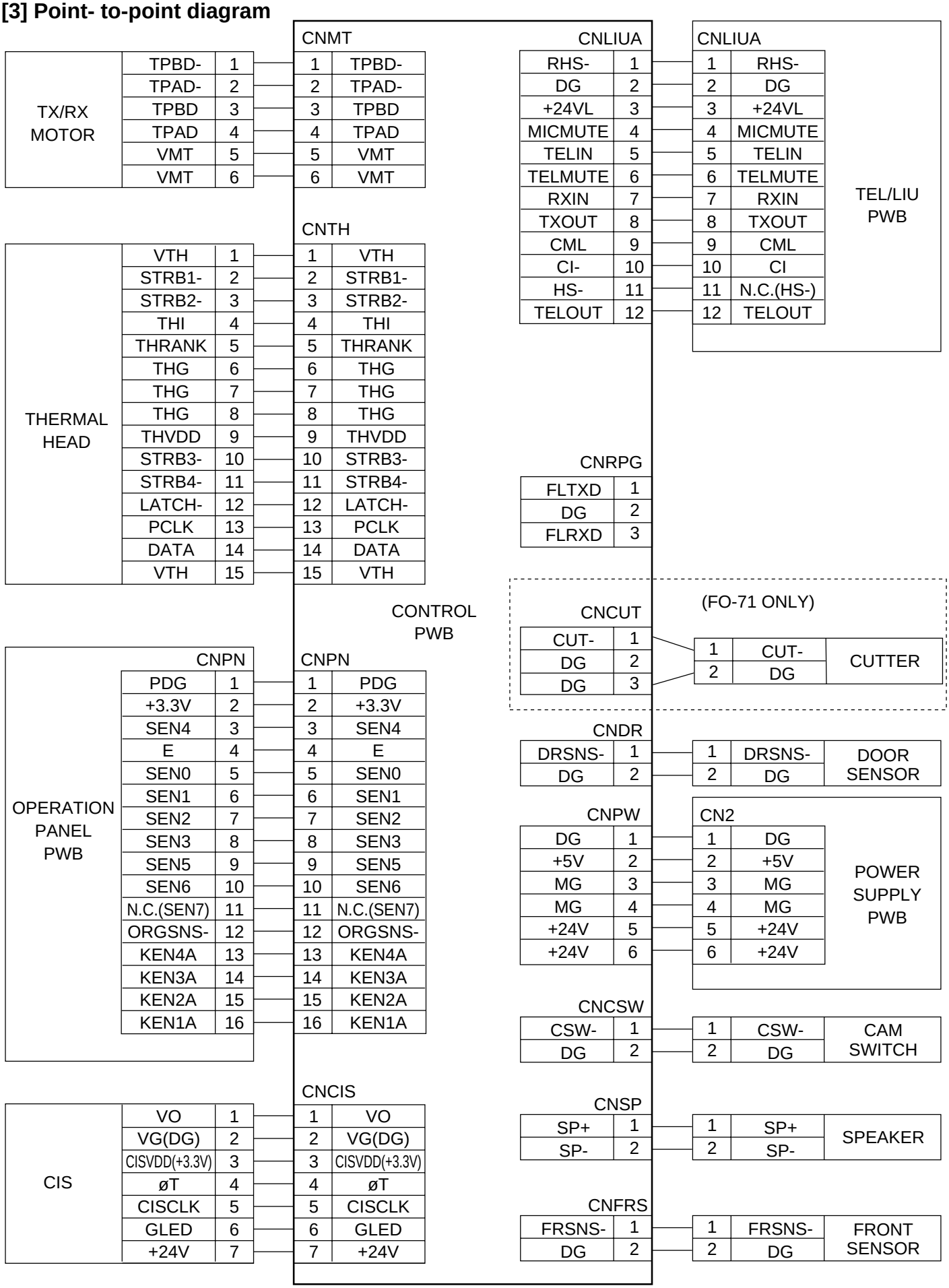
[1] Block diagram



[2] Wiring diagram



[3] Point- to-point diagram



CHAPTER 5. CIRCUIT DESCRIPTION

[1] Circuit description

1. General description

The compact design of the control PWB is obtained by using CONEXANT fax engine in the main control section and high density printing of surface mounting parts. Each PWB is independent according to its function as shown in Fig. 1.

2. PWB configuration

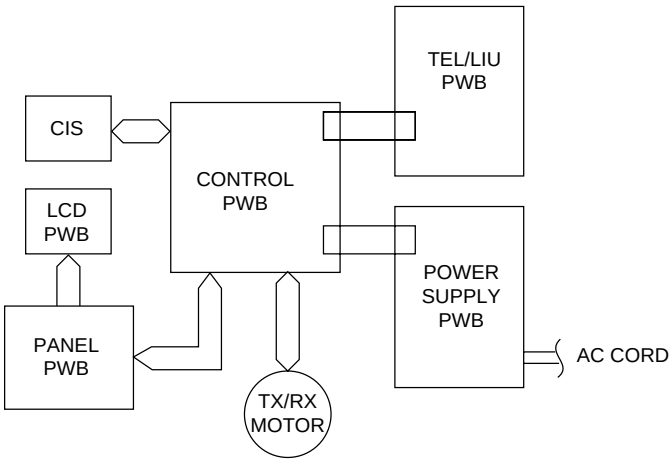


Fig. 1

1) Control PWB

The control PWB controls peripheral PWBs, mechanical parts, transmission, and performs overall control of the unit.
This machine employs a 1 chip modem (SCE209) which is installed on the control PWB.

2) TEL/LIU PWB

This PWB controls connection of the telephone line to the unit.

3) Power supply PWB

This PWB provides voltages of VREG(+5V) and +24V to the other PWBs.

4) Panel PWB

The panel PWB allows input of the operation keys.

5) LCD PWB

This PWB controls the LCD display.

3. Operational description

Operational descriptions are given below:

- Transmission operation

  When a document is loaded in stand-by mode, the state of the document sensor is sensed via the 1 chip fax engine (SCE209). With depression of the START key in the off-hook state, transmission takes place.
  Then, the procedure is sent out from the modem and the motor is rotated to move the document down to the scan line. In the scan processor, the signal scanned by the CIS is sent to the internal image processor and the AD converter to convert the analog signal into binary data. This binary data is transferred from the scan processor to the image buffer within the RAM and encoded and stored in the transmit buffer of the RAM. The data is then converted from parallel to serial form by the modem where the serial data is modulated and sent onto the line.

- Receive operation

  There are two ways of starting reception, manual and automatic.
  Depression of the START key in the off-hook mode in the case of manual receive mode, or CI signal detection by the LIU in the automatic receive mode.

  First, the SCE209 controls the procedure signals from the modem to be ready to receive data. When the program goes into phase C, the serial data from the modem is converted to parallel form in the modem interface of the 1 chip fax engine (SCE209) which is stored in the receive buffer of the RAM. The data in the receive buffer is decoded software-wise to reproduce it as binary image data in the image buffer. The data is DMA transferred to the recording processor within the SCE209 which is then converted from parallel to serial form to be sent to the thermal head. The data is printed line by line by the SCE209 which is assigned to control the motor rotation and strobe signal.

- Copy operation

  To make a copy on this facsimile, the COPY key is pressed when the machine is in stand-by with a document on the document table and the telephone set is in the on-hook state. First, depression of the COPY key advances the document to the scan line. Similar to the transmitting operation, the image signal from the CIS is converted to a binary signal in the DMA mode via the 1 chip fax engine (SCE209) which is then sent to the image buffer of the RAM. Next, the data is transferred to the recording processor in the DMA mode to send the image data to the thermal head which is printed line by line. The copying takes place as the operation is repeated.

[2] Circuit description of control PWB

1. General description

Fig. 2 shows the functional blocks of the control PWB, which is composed of 3 blocks.

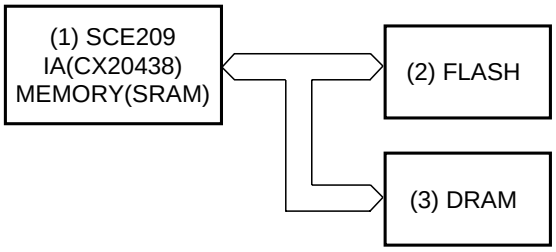


Fig. 2 Control PWB functional block diagram

2. Description of each block

(1) Main control block

The main control block is composed of CONEXANT 1 chip fax engine (SCE209), FLASH (2Mbit), DRAM (4Mbit).
Devices are connected to the bus to control the whole unit.

1) SCE209 (IC2) : pin-176 QFP (FAX CONTROLLER)

1 chip fax engine has Internal Integrated Analog (20438) and Internal memory (SRAM : 32kbit).

2) SST39VF020P (IC4): pin-32 TSOP (FLASH)

FLASH of 2Mbit equipped with software for the main CPU.

3) MSM51V4800E (IC3): pin-28 SOJ (DRAM)

Image memory for recording process.

• Memory for recording pixel data without paper.

(2) IC2 (SCE209) Hardware description

1) Integrated Controller (SCC)

The Controller contains an internal MC24 Processor with a 16-MB address space and dedicated circuitry optimized for facsimile image processing and monitoring and for thermal or thermal transfer printer support.
The CPU provides fast instruction (up to 10 MHz clock speed) execution and memory efficient input/output bit manipulation. The CPU connects to other internal functions over an 8-bit data bus and 24-bit address bus and dedicated control lines.
The 24-bit external address bus, 8-bit data bus, control, status and decoded chip select signals support connection to external ROM, SRAM, DRAM, and FLASH memory.

2) DRAM Controller

The CX06835 includes a DRAM controller with signal and page mode access support which supports fast, normal, or slow refresh time. DRAM memory space is provided in one block up to 4 MB. A maximum of 4 MB of DRAM is supported. This space has a programmable size and starting address. Refresh is performed automatically and is supported in stand-by mode. CAS and RAS signal support is provided for one-DRAM banks for both 4-bit and 8-bit organizations. Access speeds from 50ns to 70ns can be supported.

3) DMA Channels

Six internal DMA channels support memory access for scanner, T.4/T.6, and resolution conversion. DMA Channel 2 can be reprogrammed for external access to thermal printing, thermal transfer, or plain paper inkjet printing.

4) External RAM and ROM

Moveable and programmable size external SRAM memory of up to 1 MB, DRAM memory of up to 4 MB, and ROM of up to 2 MB can be directly connected to the SCE209. By using an external address decoder, the size of SRAM and/or ROM can be extended. The ROM stores all the program object code.

5) Flash Memory Controller

The SCE209 includes a flash memory controller that supports NOR, NAND, and Serial NAND-type flash memory. The supported size of NOR-type memory is up to 1 MB and the supported size of NAND-type memory is unlimited.

6) Stepper Motor Control

Eight outputs are provided to external current drivers: four to the scanner motor and four to the printer motor. The stepping patterns are programmable and selectable line times are supported. A timeout circuit controls the power control of the motors. The printer or scanner motor outputs can be programmed as GPOs for applications using single motor or paper printers.

7) T.4/T.6 Compressor/Decompressor

MH, MR and MMR compression and decompression are provided in hardware. T.4 line lengths of up to 8192 pixels are supported. MMR and Alternating Compression/Decompression (ACD) on a line by line basis provide support for up to three independent compression and decompression processes.

8) Bi-level Resolution Conversion

One independent programmable bi-level 1D-resolution conversion block is provided to perform expansion or reduction on the T.4 decompressed data and scan image data. Image expansion can be programmed up to 200% and reduction down to 33%. Vertical line O-Ring and data output bit order reversal is also provided.

9) Printer IF

The Printer Interface provides a standard connection between the SCE209 and a thermal printhead to support thermal printing or thermal transfer. The thermal printer interface consists of programmable data, latch, clock, and up to four strobe signals. Programmable timing supports traditional thermal printers, as well as the latchless split mode printers, and line lengths of up to 2048 pixels. Line times from 5 ms to 40 ms are supported.
The SCE209 includes a thermal ADC (TADC) function utilizing a D/A converter and a comparator to monitor the printhead temperature. External terminating resistors must be supplied; the values are determined by the specific printhead selected.
As an option, plain paper inkjet printing can be supported.

10) TPH Hardware Timer

The TPH hardware timer provides a 500 ms timer that can be re-triggered or reset.

11) Scanner and Video Control

Five programmable control and timing signals support common CCD and CIS scanners. The video control function provides signals for controlling the scanner and for processing its video output. Three programmable control signals (START, CLK1n, and CLK2) provide timing related to line and pixel timing. These are programmable with regard to start time, relative delay and pulse width.
Two video control output signals (VIDCTL[1:0]) provide digital control for external signal pre-processing circuitry. These signals provide a per pixel period, or per line period, timing with programmable polarity control for each signal.

12) Video Processing

The CX06835 supports two modes of shading correction for scanner data non-uniformity arising from uneven sensor output or uneven illumination. Corrections are provided on either an 8-pixel group or are applied separately to each pixel. Dark level correction and gamma correction are also provided.
Two-dimensional Error Diffusion/Dithering is performed on halftone images.
The CX06835 includes an 8 x 8 dither table, which is programmable and stored internally (8-bit per table entry). The table is arranged in a matrix of 8 rows by 8 columns. The video processing circuit provides mixed-mode detection/processing and multi-level Resolution Conversion for the scanner multi-level data. The conversion ratio of the multi-level Resolution Conversion is fixed to B4-A4 conversion.

13) Operator Panel Interface

Operation Panel functions are supported by the operator output bus OPO[6:0], the operator input bus OP[3:0], and two control outputs (LCDCS and LEDCTRL).
The CX06835 can directly interface to a 28-key keypad.
A 2-line LCD display module with 20 characters per line can be supported.

14) Synchronous Serial Interface (SSIF)

One or optionally two Synchronous only Serial Interfaces (SSIF) are built into the CX06835, which allows it to communicate with external peripherals. Each SSIF provides separate signals for Data (SSTXD, SSRXD), Clock (SSCLK), and Status (SSSTAT). Each SSIF is a duplex, three-wire system. The SSIF may be configured to operate as either a master or a slave interface. The bit rate, clock polarity, clock phase, and data shifting order are programmable.

15) Synchronous/Asynchronous Serial Interface (SASIF)

One or optionally two Synchronous/Asynchronous Serial Interface (SASIF) performs the following:
• Serial-parallel conversion of data received from a peripheral device.
• Parallel-to-serial conversion of data for transmission to a peripheral device.
This interface consists of serial transmit data (SASTXD), serial receive data (SASRXD), and a serial clock(SASCLK). The SASIF includes a programmable bit rate generator for asynchronous and synchronous operations. The data shifting order, data bit number, and the SASCLK polarity are programmable.
The optional SASIF 2 has an additional pin called DSS_AVAIL. This signal can be used to tristate the SASCLK2 and SASTXD2 signals.

16) Real Time Clock (RTC)

The CX06835 includes a battery backup real time clock. The RTC will automatically maintain the proper date and time for 32 years. Leap year compensation is included. A 32.768 kHz or 65.536 kHz crystal is required by the RTC.

17) Tone Generator (ALT_TONE)

The CX06835 provides a programmable tone generator output. The frequency of the tone generator is programmable from 400 Hz to 4 kHz. By using a PWM programmable high frequency as a modulation frequency, the output level can be made programmable.

18) Watchdog Timer

The Programmable Watchdog Timer is intended to guard against firmware lockup on the part of either executive-controlled background tasks or interrupt-driven tasks, and can only be enabled by a sequence of events under control of the Watchdog Control Logic. Once the Watchdog Timer has been enabled, it can not be disabled unless a system reset occurs.

19) Reset and Power Control

The RESETn I/O pin provides an internally generated reset output to external circuits, or it can accept an externally generated reset signal. This reset signal will not reset the RTC. Separate RTC battey power inputs are provided for battery-backup functions. A BATRSTn pin is provided, which resets the RTC circuits and other SCC circuits.

20) Power Up/Down Control

Power Up/Down detection is provided internally. The threshold voltages are:
• Power Up detection level = 2.83V to 2.95V.
An internally generated power down signal controls internal switching between primary and battery power. This control signal is also provided as an output on the PWRDWNn pin. An externally generated power down detector (optional) can be provided as an input on the PWRDWNn pin by setting the INTPWRDWNEn pin.

21) Stand-by and Sleep Modes

Two power saving modes are provided to reduce the power consumption. In stand-by mode, the CPU is functional, but the modem clock is turned off to save power. When this occurs, the modem may be activated by software under different conditions. In sleep mode, the clock is cut off from both the modem and the CPU to increase the power savings.
The system can be activated by paper insertion, key pressing events, and telephone ring detection.

22) Embedded Modem DSP

The embedded modem DSP is a synchronous 9600 bps half-duplex modem with error detection and DTMF generation/reception. It provides data transmission/reception from regular PSTN lines, PBX, or private lines.
The modem can operate at any standard V.29 data speed up to 9600 bps as well as in V.21 and V.23 modes.
The modem is designed for use in Group 3 facsimile machines. It satisfies the requirements specified in ITU-T recommendations V.29, V.27ter, V.21 Channel 2, and T.4 , and meets the signaling requirements of T.30. It also performs HDLC framing according to T.30 at all speeds.

Note: For technical details, refer to the FM209/FM214 Designer's Guide, (document 1175).

23) Software and Firmware Support Features

Available software and embedded firmware provides the following:
• Modem support for speeds up to 9600 bps.
• ECM under conditional assembly.
• DRAM memory support under conditional assembly.
• MH, MR and MMR support.
• Page memory receiving.
• 5ms minimum scan line time.
• Conditional Error Diffusion or Dither table (8x8) support.
• Dark Level Correction support.
• Single motor support.
• 28-key operator panel support.
• Call progress support for Europe and U.S.A.
• Monochrome inkjet print engine support.

SCE209 (IC2) Terminal descriptions

Pin No.	Pin List	I/O	Input Type	Output Type	Pin Description
1	VDDPLL	—	—	—	PLL Power
2	VSSPLL	—	—	—	PLL GND
3	ROMCSn	O	—	13Xs	—
4	SYNC/GPO[20]	O	—	13Xs	—
5	WRn	O	—	13Xs	—
6	RDn	O	—	13Xs	—
7	DEBUGn	I	Hu	—	—
8	TSTCLK	O	—	13Xs	—
9	VSS	—	—	—	Digital GND
10	SXIN	I	Osc0	—	—
11	SXOUT	O	—	Osc0	—
12	OPO[0]/GPO[8]/SMPWRCTRL	O	—	13Xs	—
13	OPO[1]/GPO[9]/PMPWRCTRL	O	—	13Xs	—
14	OPO[2]/GPO[10]/RINGER	OZ	—	13Xs	—
15	OPO[3]/GPO[11]	O	—	13Xs	—
16	OPO[4]/GPO[12]/SSTXD1	O	—	13Xs	—
17	OPO[5]/GPO[13]	O	—	13Xs	—
18	OPO[6]/GPO[14]	O	—	13Xs	—
19	OPI[0]/GPIO[21]/SSRXD1	I/O	Hu	13Xs	—
20	OPI[1]/GPIO[22]/SSSTAT1	I/O	Hu	13Xs	—
21	OPI[2]/GPIO[23]/SSCLK1	I/O	Hu	13Xs	—
22	OPI[3]/GPIO[24]	I/O	Hu	13Xs	—
23	LCDCS/GPO[17]	O	—	1XC	—
24	VDD	—	—	—	Digital Power
25	RASn	O	—	13Xs	—
26	CAS[0]n	O	—	13Xs	—
27	DWRn	O	—	13Xs	—
28	VBAT	—	—	—	RTC Battery Power
29	XIN	I	Osc1	—	—
30	XOUT	O	—	Osc1	—
31	WRPROTn	O	—	1XC	—
32	TEST[1]	I	Hd	—	—
33	TEST[0]	I	Hd	—	—
34	BATRSTn	I	H	—	—
35	INTPWRDWNEn	I	H	—	—
36	PWRDWNn	I/O	H	13Xs	—
37	N.C.	—	—	—	—
38	ADGA	—	VADG	—	PADC Analog GND
39	VREFn/CLREF	I	VR-	—	PADC
40	VIN	I	VA	—	PADC
41	ADGA	—	VADG	—	PADC Analog GND
42	ADVA	—	VADV	—	PADC Analog Power
43	ADXG	—	VXG	—	PADC
44	VREFp	I	VR	—	PADC
45	VSS	—	—	—	VSS Digital GND
46	IVREFn	O	—	VR-	PADC
47	IVREFp	O	—	VR+	PADC
48	VDD	—	—	—	Digital Power
49	THADI	I	Analog	—	TADC
50	VSS	—	—	—	Digital GND
51	GPIO[17]/DSPIRQn	I/O	Hu	13Xs	—
52	GPIO[16]/IRQ[8]	I/O	Hu	13Xs	—
53	GPIO[15]/CS[5]n	I/O	Hu	13Xs	—
54	GPIO[13]/CS[3]n	I/O	Hu	13Xs	—
55	GPIO[37]/IRQ15n/DSPCSn	I	Hu	13Xs	—
56	GPIO[4]/CPCIN/TPHPWRCTRL/DMAREQ	I/O	Hu	13Xs	—
57	STRB[0]	O	—	1XC	—
58	STRB[1]	O	—	1XC	—
59	STRB[2]	O	—	1XC	—
60	STRB[3]	O	—	1XC	—
61	PLAT	O	—	3XC	—
62	PDAT	O	—	2XC	—
63	PCLK/DMAACK	O	—	3XC	—

SCE209 (IC2) Terminal descriptions

Pin No.	Pin List	I/O	Input Type	Output Type	Pin Description
64	VDD	—	—	—	Digital Power
65	GPIO[11]/BE/SERINP/SR4IN	I/O	Hu	13Xs	—
66	GPIO[19]/RDY/SEROUT	I/O	Hu	13Xs	—
67	START	O	—	2XC	—
68	CLK1n/GPO[25]	O	—	13Xs	—
69	CLK2/GPO[24]	O	—	13Xs	—
70	GND	—	—	—	IA GND
71	MCLK	ID	—	—	Main Clock from DSP
72	CTRLI	ID	d	—	Control Data from DSP
73	TESTC	ID	d	—	IA Test
74	SOUT	OD	—	T	Serial Data to DSP
75	SIN	ID	d	—	Serial Data to DSP
76	FSYNC	I/OD	d	—	Frame Sync Signal (IA)
77	POR	IA	d	—	Hardware Reset
78	GND	—	—	—	IA GND
79	LINE_INP	IA	—	—	Analog Input to Line Pre-Amp.
80	MIC_INP	IA	—	—	Positive differential Analog Input to Microphone Pre-Amp.
81	MIC_INM	IA	—	—	Negative differential Analog Input to Microphone Pre-Amp.
82	MIC_BIAS	OA	—	—	2.2 V Nominal DC Bias Source for Electret Microphone
83	BG	OA	—	—	Analog reference Voltage Output
84	VC	OA	—	—	Analog Ground Bias Output
85	AVDD	PWR	—	—	IA Analog Power
86	GND	—	—	—	IA GND
87	LINE_OUTP	OA	—	—	Line Driver Output
88	SPKR_OUTP	OA	—	—	Positive Speaker Driver Output
89	SPKR_OUTM	OA	—	—	Negative Speaker Driver Output
90	DVDD	PWD	—	—	IA Digital Power
91	MODE_0	ID	u	—	Connect to VSS (IA Mode Selection)
92	ICLK	I/OD	—	—	IA Bit Clock Input/Output
93	VSS	—	—	—	VSS Digital GND
94	FCSn[1]/VIDCTL[0]/GPO[23]	O	—	13Xs	—
95	IARESET	O	—	13Xs	DSP to EXTIA POR
96	IACLK	O	—	13Xs	DSP to EXTIA MCLK
97	VDD	—	—	—	Digital Power
98	IA1CLK	I	H	—	DSP from EXTIA ICLK
99	SR3IN/DSPIRQn	I	H	—	DSP from primary EXTIA SOUT/EXT. Modem IRQn
100	SR4OUT	O	—	13Xs	DSP to primary EXTIA SIN
101	SR1IO	O	—	13Xs	DSP to EXTIA CTRL1
102	SA1CLK	I	H	—	DSP from EXTIA FSYNC
103	GPIO[7]/SSRXD2/SASRXD2	I/O	Hu	13Xs	—
104	GPIO[6]/SSTXD2/SASTXD2	I/O	Hu	13Xs	—
105	GPIO[5]/SSCLK2/SASCLK2	I/O	Hu	13Xs	—
106	GPIO[10]/SSSTAT2/DSS_AVAIL	I/O	Hu	13Xs	—
107	VSS	—	—	—	Digital GND
108	RESETn	I/O	Hu	2XC	—
109	GPIO[3]/SASCLK	I/O	Hu	13Xs	—
110	GPIO[2]/SASRXD	I/O	Hu	13Xs	—
111	GPIO[1]/SASTXD	I/O	Hu	13Xs	—
112	GPIO[9]/FRDn	I/O	Hu	13Xs	—
113	GPIO[8]/FWRn	I/O	Hu	13Xs	—
114	A[0]	I/O	Tu	13Xs	CPU Address Bus
115	A[1]	I/O	Tu	13Xs	CPU Address Bus
116	A[2]	I/O	Tu	13Xs	CPU Address Bus
117	A[3]	I/O	Tu	13Xs	CPU Address Bus
118	A[4]	I/O	Tu	13Xs	CPU Address Bus
119	VDD	—	—	—	Digital power
120	A[5]	I/O	Tu	13Xs	CPU Address Bus
121	A[6]	I/O	Tu	13Xs	CPU Address Bus
122	A[7]	I/O	Tu	13Xs	CPU Address Bus
123	A[8]	I/O	Tu	13Xs	CPU Address Bus
124	A[9]	I/O	Tu	13Xs	CPU Address Bus
125	A[10]	I/O	Tu	13Xs	CPU Address Bus
126	A[11]	I/O	Tu	13Xs	CPU Address Bus

SCE209 (IC2) Terminal descriptions

Pin No.	Pin List	I/O	Input Type	Output Type	Pin Description
127	A[12]	I/O	Tu	13Xs	CPU Address Bus
128	A[13]	I/O	Tu	13Xs	CPU Address Bus
129	A[14]	I/O	Tu	13Xs	CPU Address Bus
130	A[15]	I/O	Tu	13Xs	CPU Address Bus
131	A[16]	I/O	Tu	13Xs	CPU Address Bus
132	VDD	—	—	—	Digital Power
133	VSS	—	—	—	Digital GND
134	A[17]	I/O	Tu	13Xs	CPU Address Bus
135	A[18]	I/O	Tu	13Xs	CPU Address Bus
136	A[19]	I/O	Tu	13Xs	CPU Address Bus
137	A[20]	I/O	Tu	13Xs	CPU Address Bus
138	A[21]/EYECLK	I/O	Tu	13Xs	CPU Address Bus
139	A[22]/EYESYNC	I/O	Tu	13Xs	CPU Address Bus
140	A[23]/EYEXY	I/O	Tu	13Xs	CPU Address Bus
141	D[0]	I/O	Tu	13Xs	CPU Data Bus
142	D[1]	I/O	Tu	13Xs	CPU Data Bus
143	D[2]	I/O	Tu	13Xs	CPU Data Bus
144	D[3]	I/O	Tu	13Xs	CPU Data Bus
145	D[4]	I/O	Tu	13Xs	CPU Data Bus
146	D[5]	I/O	Tu	13Xs	CPU Data Bus
147	D[6]	I/O	Tu	13Xs	CPU Data Bus
148	D[7]	I/O	Tu	13Xs	CPU Data Bus
149	GPIO[20]/ALTTONE	I/O	Hu	13Xs	—
150	GPIO[26]	I/O	Hu	13Xs	—
151	GPIO[27]	I/O	Hu	13Xs	—
152	GPIO[28]	I/O	Hu	13Xs	—
153	GPO[26]	O	—	13Xs	—
154	GPO[27]	O	—	13Xs	—
155	GPO[28]	O	—	13Xs	—
156	GPO[29]	O	—	13Xs	—
157	GPO[30]/SR3OUT	O	—	13Xs	—
158	GPIO[29]	I/O	Hu	13Xs	—
159	GPIO[31]	I/O	Hu	13Xs	—
160	GPIO[32]	I/O	Hu	13Xs	—
161	VDD	—	—	—	Digital power
162	GPIO[34]	I/O	Hu	13Xs	—
163	GPIO[35]	I/O	Hu	13Xs	—
164	GPIO[36]	I/O	Hu	13Xs	—
165	Vss	—	—	—	Digital GND
166	VDD	—	—	—	Digital Power
167	PM[0]/GPO[0]	O	—	13Xs	—
168	PM[1]/GPO[1]	O	—	13Xs	—
169	PM[2]/GPO[2]	O	—	13Xs	—
170	PM[3]/GPO[3]	O	—	13Xs	—
171	SM[0]/GPO[4]	O	—	13Xs	—
172	SM[1]/GPO[5]	O	—	13Xs	—
173	SM[2]/GPO[6]	O	—	13Xs	—
174	SM[3]/GPO[7]	O	—	13Xs	—
175	REGDMA/GPO[18]/CLKDIV[0]	I/O	T	13Xs	—
176	WAITn/GPO[19]/CLKDIV[1]	I/O	T	13Xs	—

(3) Panel control block

The following controls are performed by the SCE209.

- Operation panel key scanning
- Operation panel LCD display

(4) Mechanism/recording control block

- Recording control block diagram (1)

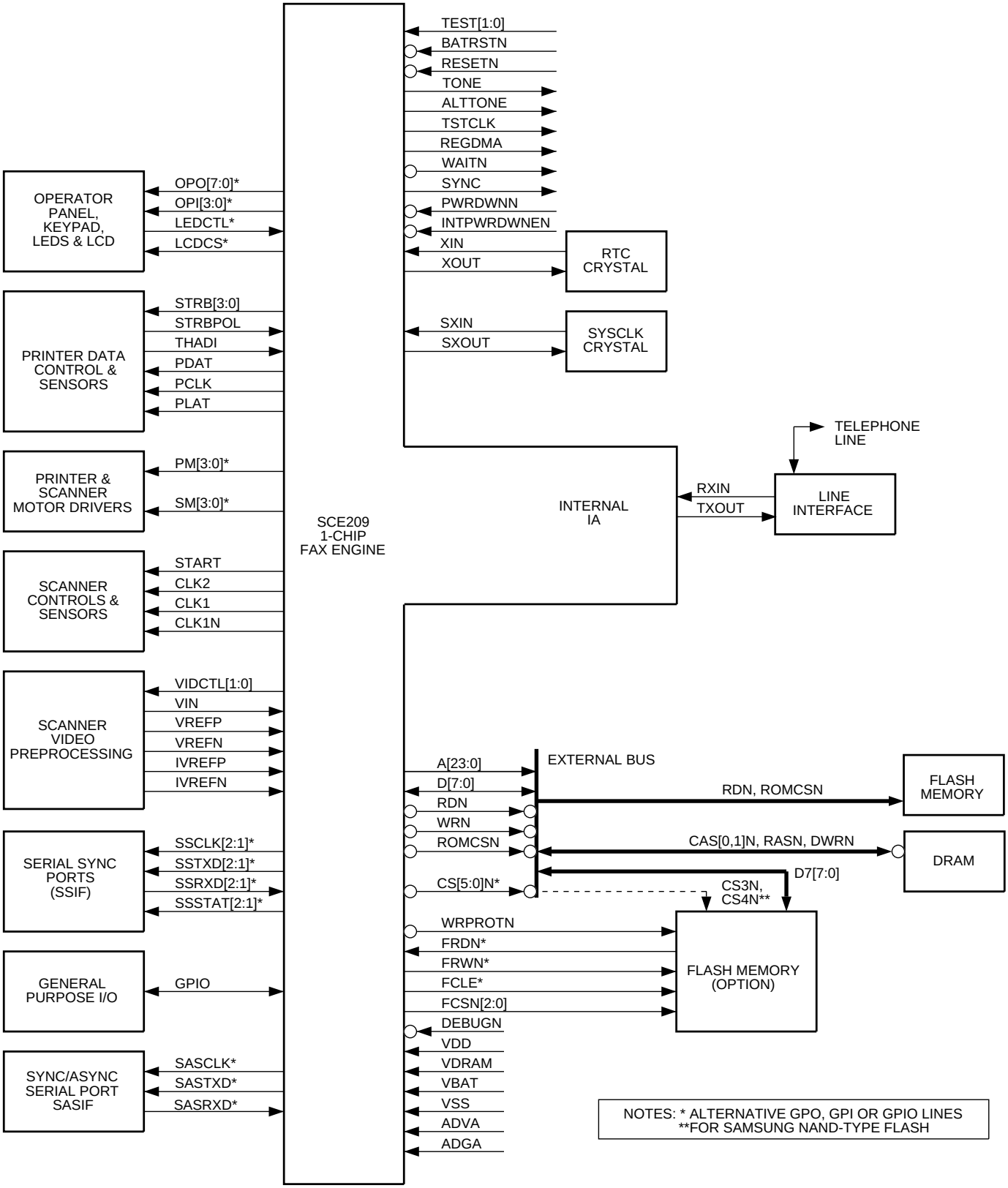


Fig. 3

(5) Modem block (CX20438)

Integrated Analog Control Resisters for CX20438

The CX20438 IA can be used as a Primary Integrated Analog (PIA) codec or as a Secondary Integrated Analog (SIA) codec, depending on the signal connection with the SCE Controller ASIC device. In the SCE100 product, both the PIA and the SIA are packaged external to the SCE Controller device, whereas in the SCE209, the PIA is packaged with the SCE209 Controller and the SIA is external.
The CX20438 IA provides gain, filtering, internal analog switching, and an internally sourced microphone bias output. The IA is controlled by three control registers and an address register located in internal RAM space which are accessed via the modem interface memory. These registers provide individual controls for the IA's inputs, outputs, gain settings, and switching.
The registers are located in internal DSP RAM. Each bit of each 8-bit IA control register has exactly the same meaning for the PIA and the SIA. The LSB of each 16-bit address contents is used to control the PIA. The MSB of each 16-bit address contents is used to control the SIA.
The following table the PIA/SIA control register RAM access code.

Register	SBRAMx	BRx	Crx	IOx	AREXx	ADDx	PIA Reg*	SIA Reg*
IACR1	0	0	0	0	0	D0	0	1
IACR2	0	0	0	0	0	D4	0	1
IACR3	0	0	0	0	0	D5	0	1
IAADD	0	0	0	0	0	CE	0, 1	0, 1
NOTES: *Registers to use when x=1. When x=2, add 10h.								

- For changes made to IACR1 tobe effective, the host must write to IAADD with a value of 0002h.
- For changes made to IACR2 tobe effective, the host must write to IAADD with a value of 0006h.
- For changes made to IACR3 tobe effective, the host must write to IAADD with a value of 0007h.

Configuration default values are shown below.

DEFAULT VALUE			
CONFIGURATION	**IACR1**	**IACR2**	**IACR3**
V.17/V.33	1D9Eh	0008h	0000h
V.29	1D9Eh	0008h	0000h
V.27ter	1D9Eh	0008h	0000h
V.21 Ch. 2	1D9Eh	0008h	0000h
V.23/Caller ID	1D9Eh	0008h	0000h
Tone Transmit/Detect	1D9Eh	0008h	0000h
Voice/Audio Codec	0D16h	0008h	0000h
Speakerphone	0D16h	0008h	0000h

The following signal flow block diagram is for a signal IA and it applies to both PIA and SIA.

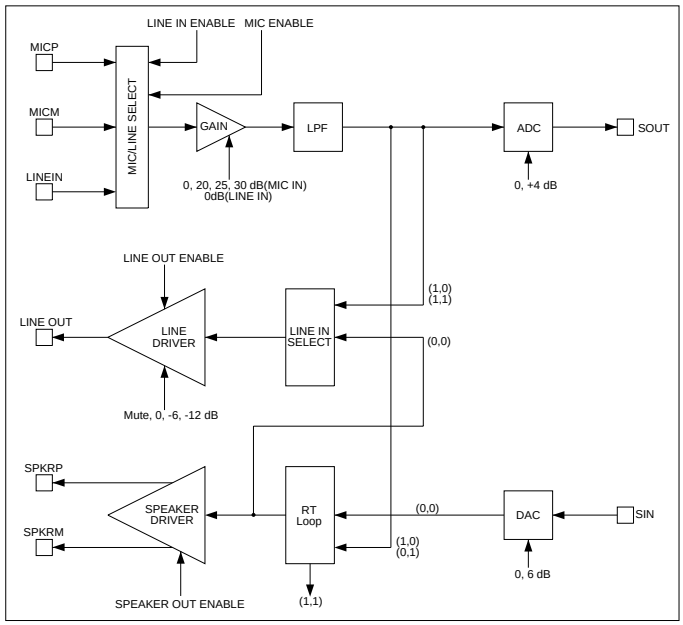


Fig. 4 PIA/SIA Signal Flow Control

[3] Circuit description of TEL/LIU PWB

(1) TEL/LIU block operational description

1) Block diagram

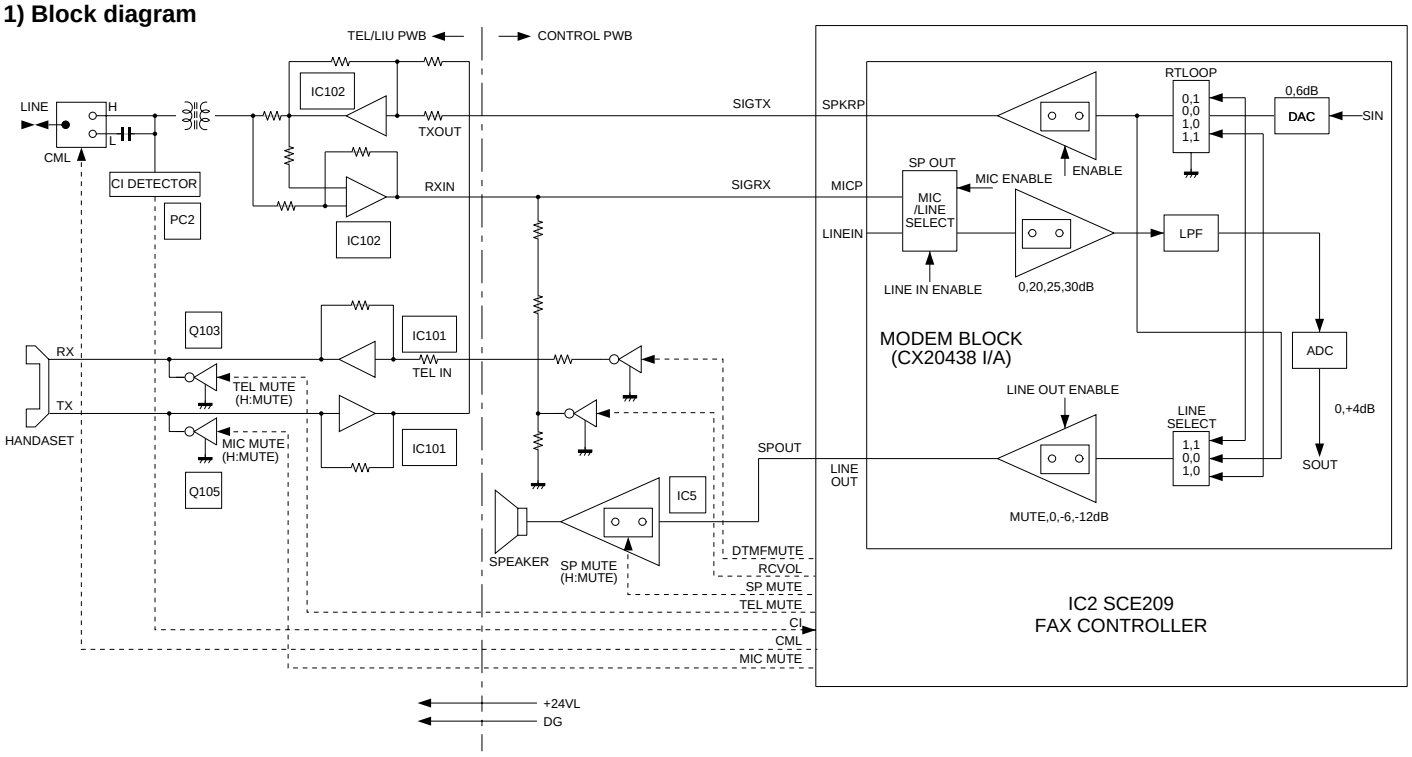


Fig. 5

2) Circuit description

The TEL/LIU PWB is composed of the following 6 blocks.

1. Speech circuit section
2. Dial transmission section
3. Speaker amplifier section
4. Ringer circuit section
5. CI detection circuit
6. Signal/DTMF transmission level & receiving level

3) Block description

1. Speech circuit section

- This circuit is composed by IC101,IC102 and that circumference circuit.

2. Dial transmission section

- D.P. transmission: The CML relay is turned on and off for control in the DP calling system. (Refer to the attached sheet.)
- DTMF transmission: It is formed in the modem, and is output.

3. Speaker amplifier section

- Ringer volume :It is controlled by the combination of the attenuator value of the LINE DRIVER in the modem and the ringer sending level sent from the modem.
- Speaker volume :It is controlled by the attenuator value of the LINE DRIVER in the modem.

4. Ringer circuit section

- The ringer sound is formed in the tone of modem when CI signal is detected. The amplifier circuit drives the speaker of the main body.

5. CI detection circuit

- CI is detected by the photo coupler which is integrated in series in the primary side TEL circuit well proven in the existing unit.

6. Signal/DTMF transmission level & receiving level

- Signal transmission level setting: According to soft switch list.
- DTMF transmission level setting: According to soft switch list.

4) Signal selection

The following signals are used to control the transmission line of TEL/FAX signal. For details, refer to the signal selector matrix table.

[Control signals from output port]

<table>
<tr><th>Signal Name</th><th>Description</th></tr>
<tr><td>CML
(The circuit is located in the TEL/LIU PWB.)</td><td>Line connecting relay and DP generating relay
H: Line make
L: Line break</td></tr>
<tr><td>MIC MUTE
(The circuit is located in the TEL/LIU PWB.)</td><td>Handset transmission mute control signal
H: Muting
L: Muting cancel</td></tr>
<tr><td>TELMUTE</td><td>Handset reception mute control signal
H: Muting
L: Muting cancel</td></tr>
<tr><td>DTMFMUTE
(The circuit is located in the control PWB.)</td><td>DTMFMUTE control signal
<table>
<tr><td>Volume</td><td>High</td><td>Middle</td><td>Low</td><td>DTMF sending</td></tr>
<tr><td>DTMFMUTE</td><td>L</td><td>L</td><td>H</td><td>H</td></tr>
</table>
Note: The DTMF sending listed above is DTMF signal sending in the handset OFF-HOOK mode.</td></tr>
</table>

VOLUME SETTING		LINEOUT A		RCVOL	DTME
		(HIGH)	(LOW)		MUTE
DTMF Transmission volume setting (Receiver)	Fixed			1	1
Key buzzer volume setting	Fixed				
Speaker volume setting	Low	1	1		
	Middle	1	0		
	High	0	1		
Ringer volume setting	Low	1	1		
	Middle	1	0		
	High	0	1		
DTMF speaker volume setting	Low	1	1		
	Middle	1	0		
	High	0	1		

[Signals for status recognition according to input signals]

Signal Name	Function
$\overline{\text{RHS}}$	H:The handset is in the on-hook state. L: The handset is in the off-hook state.
CI	Incoming call (CI) detection signal

[Other signals]

Signal Name	Function
TELIN	Receiving signal from line or modem
TXOUT	Transmission (DTMF) analog signal output from modem
RXIN	Reception (DTMF, others) analog signal input into modem

NO	Signal Name (CNLIUA)	NO	Signal Name (CNLIUA)
1	RHS-	7	RXIN
2	DG	8	TXOUT
3	+24VL	9	CML
4	MICMUTE	10	CI
5	TELIN	11	N.C.(HS-)
6	TELMUTE	12	TELOUT

(Example: SENDING/RECEIVING)

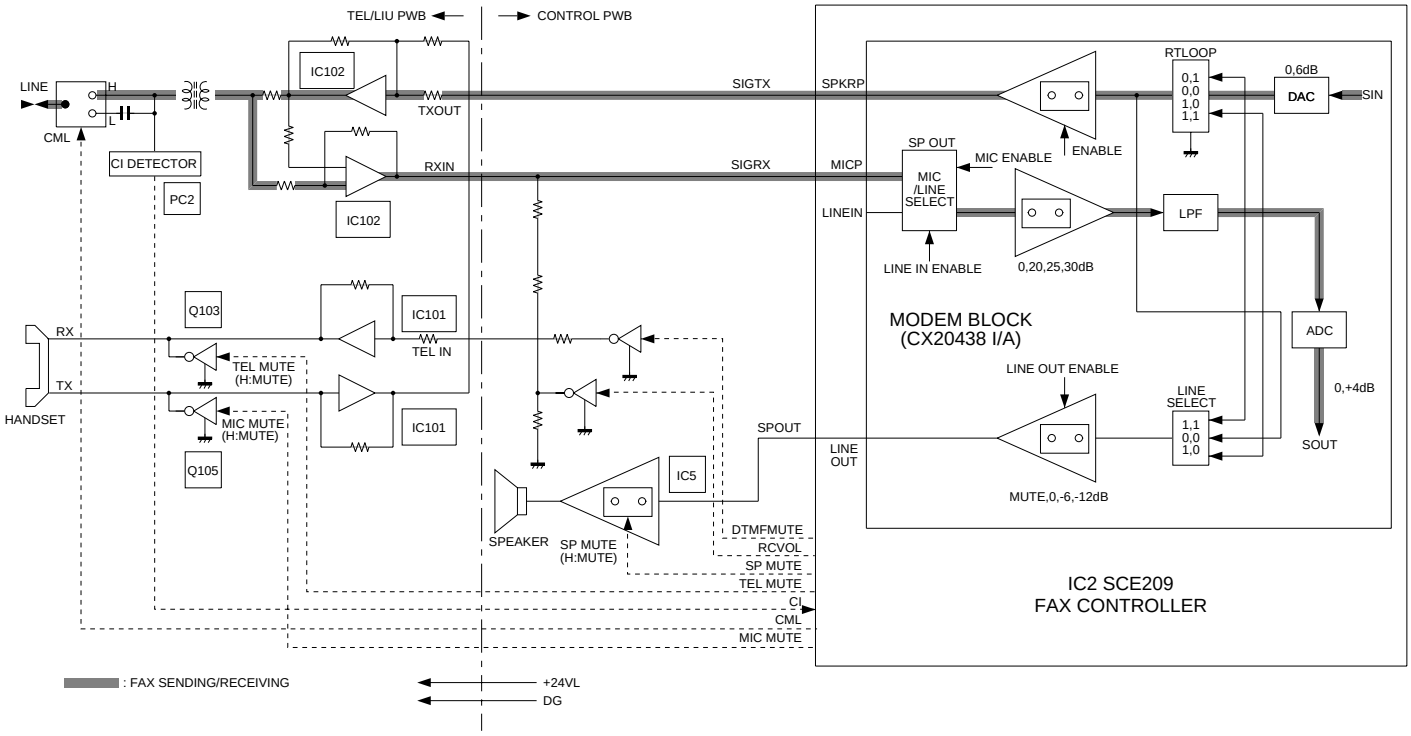


Fig. 6

[4] Circuit description of power supply PWB

1. Block diagram

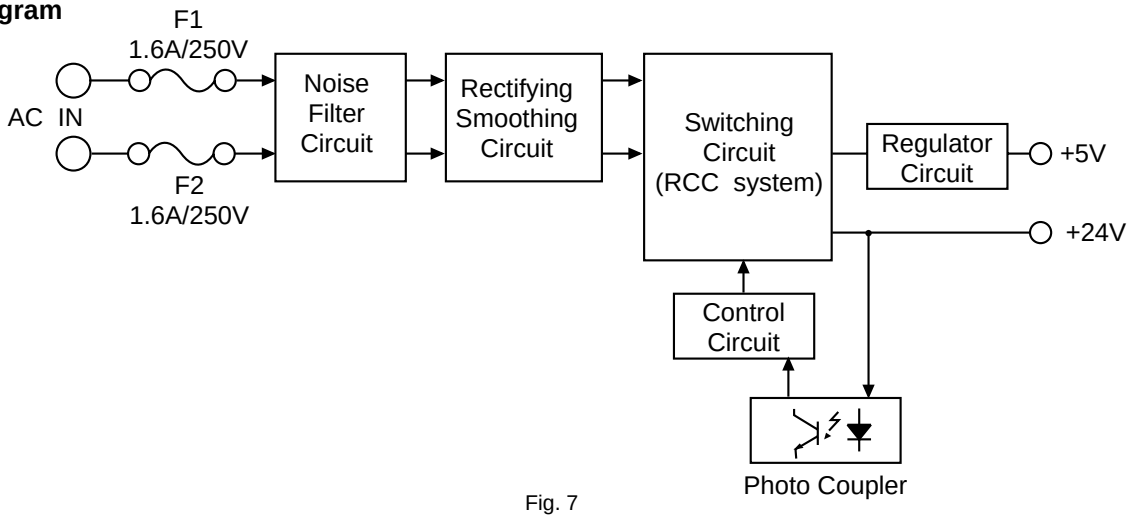


Fig. 7

2-1. Noise filter circuit

The input noise filter section is composed of L1, C1, C15 and C21 which reduces normal mode noise from the AC line and common mode noise to the AC line.

2-2. Rectifying/smoothing circuit

The AC input voltage is rectified by diode D1, 2, 3, 4 and smoothed by capacitor C2 to supply DC voltage to the switching circuit section.

Power thermistor TH1 suppresses inrush current at power switch-on.

2-3. Switching circuit

This circuit includes MOS FET Q1 and the gate drive circuit, and components around Q1.

In this circuit, the DC voltage supplied from the rectifying/smoothing section is converted into high frequency pulses by ON/OFF repetition of Q1.

2-4. Control circuit

This circuit controls output voltage of 24V by adjusting ON period of Q1, looking at signal from photo-coupler PC1.
In this operation PC1 takes charge of important part .
The over current protection is performed by bringing Q1 to OFF state through detection of voltage of T1 subwinding .
The over voltage protection is performed by operating the over current protection circuit through detection of zener diode ZD4 anb short-circuiting of load.

2-5. +5V circuit

DC voltage supplied by rectifying the output of transformer T1 with diode D8 is stabilized by 3-terminal regulator IC1.

[5] Circuit description of CIS unit

1. CIS (Contact Image Sensor)

CIS is an image sensor which puts the original paper in close contact with the full-size sensor for scanning, being a monochromatic type with the pixel number of 1,728 dots and the main scanning density of 8 dots/mm.

It is composed of sensor, rod lens, LED light source, light-conductive plate, control circuit and so on, and the reading line and focus are previously adjusted as the unit.
Due to the full-size sensor, the focus distance is so short that the set is changed from the light weight type to the compact type.

2. Waveforms

The following clock is supplied from SCE209 of the control board, and VO is output.

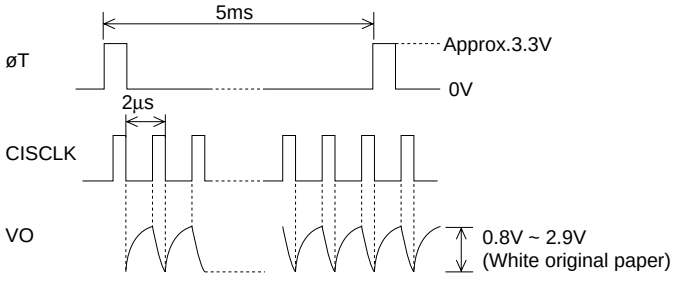
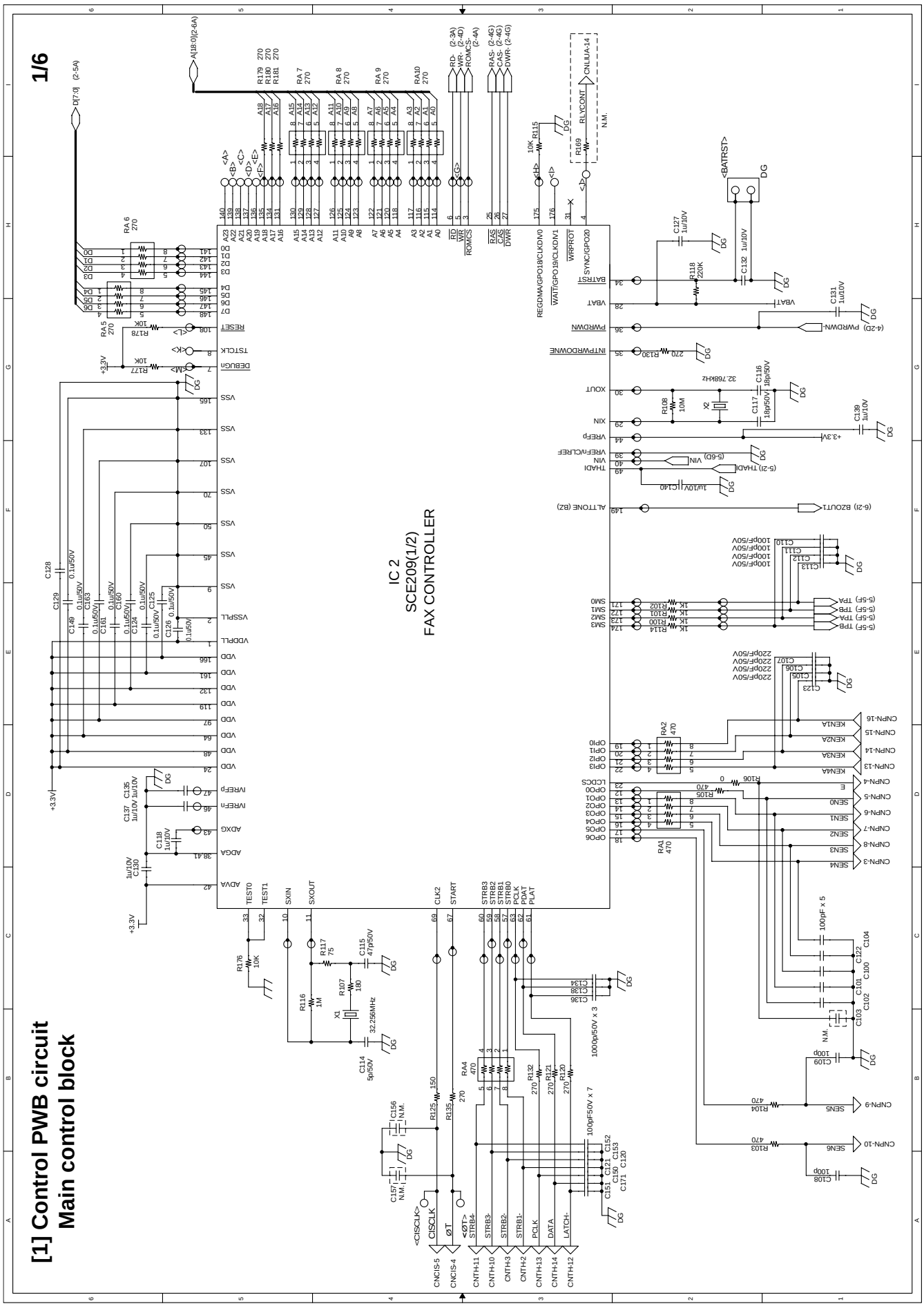
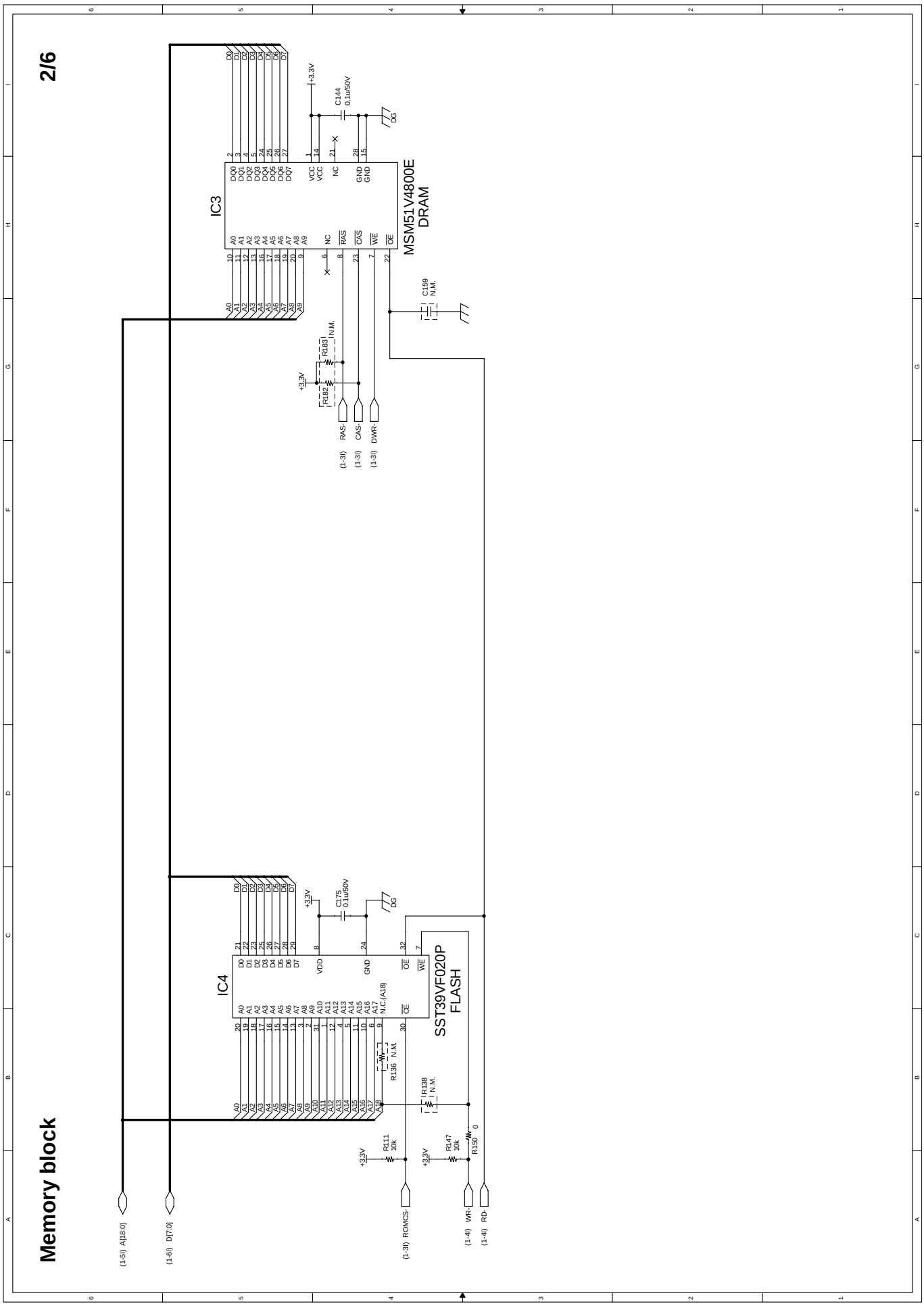
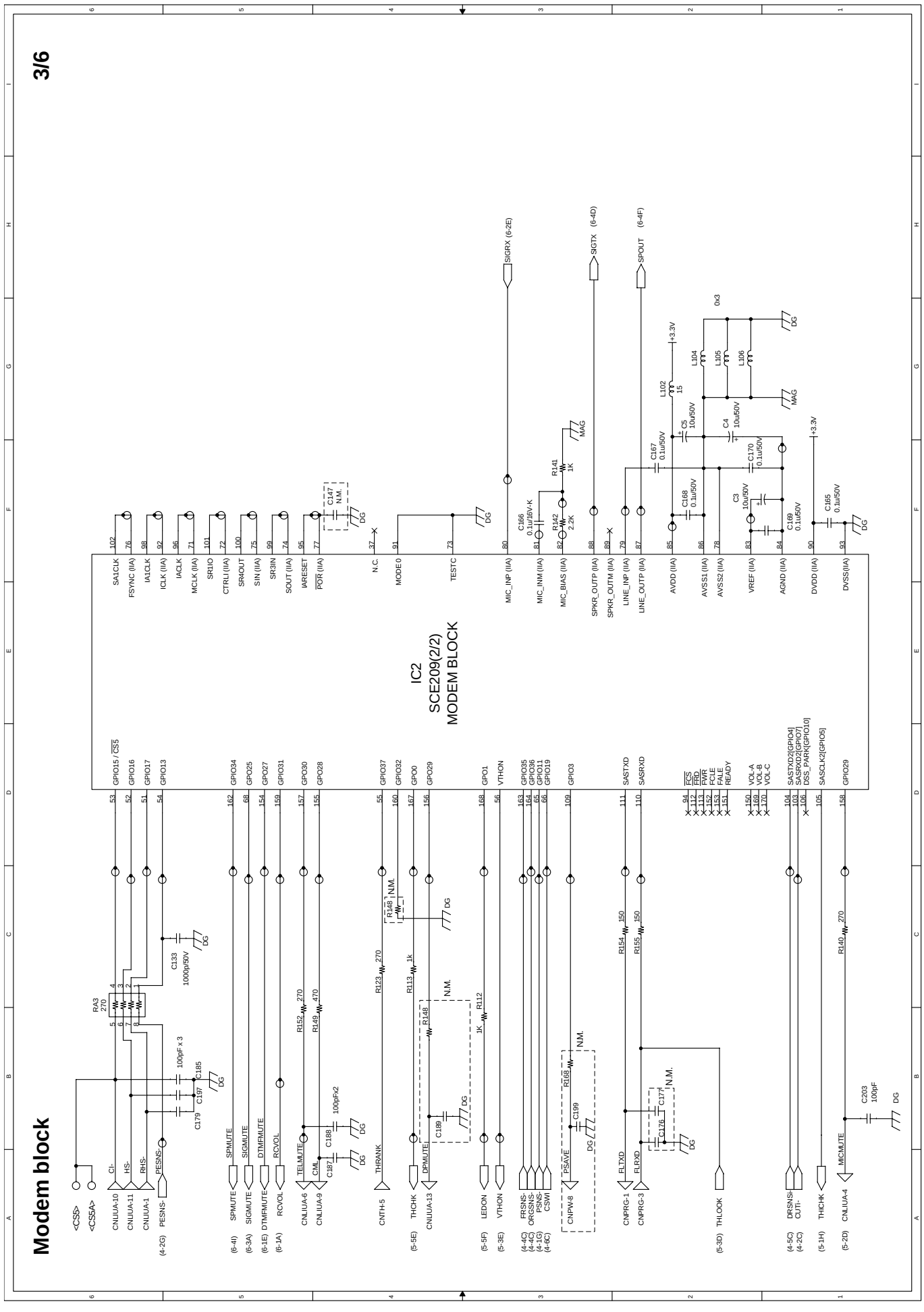


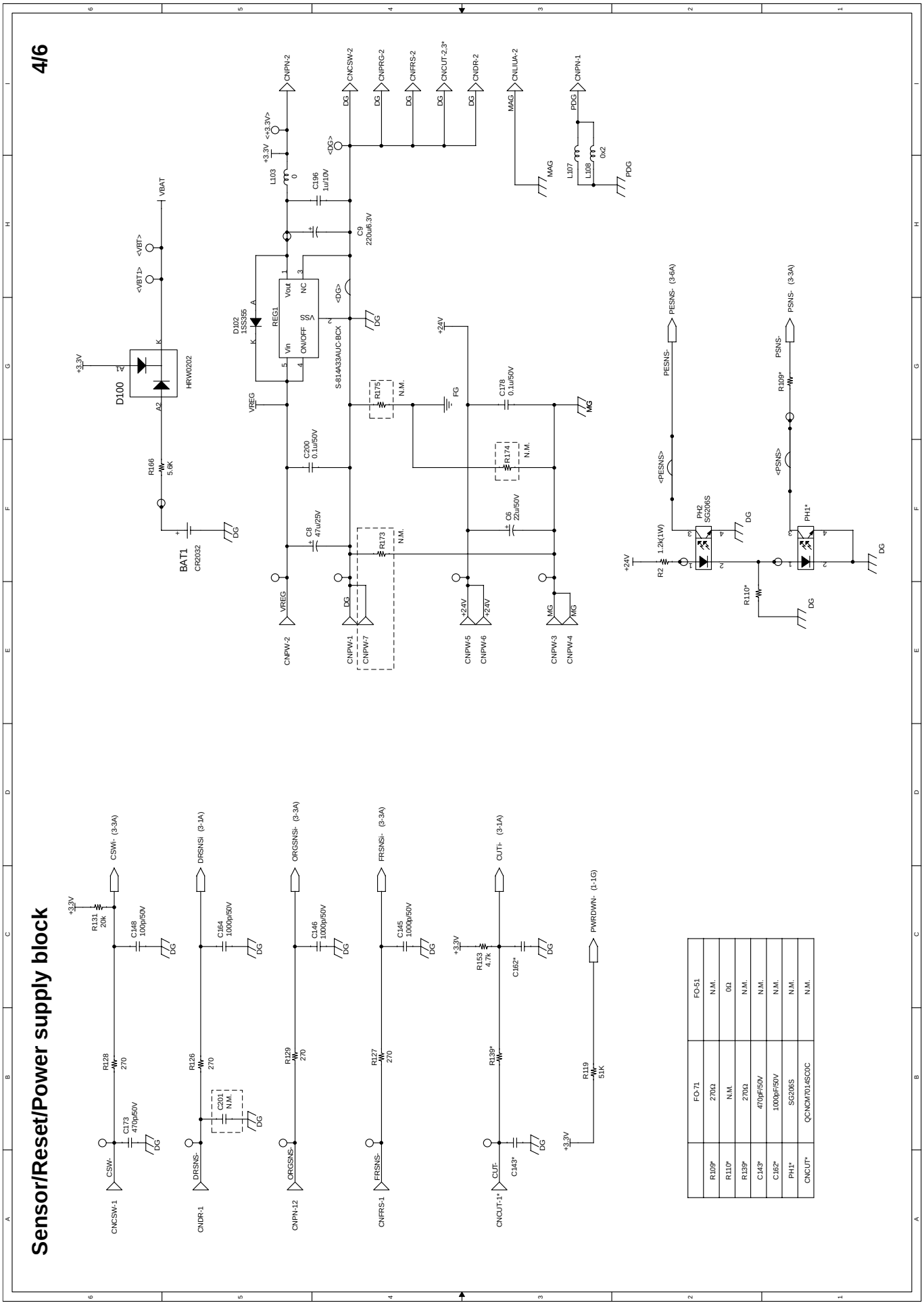
Fig. 8

CHAPTER 6. CIRCUIT SCHEMATICS AND PARTS LAYOUT

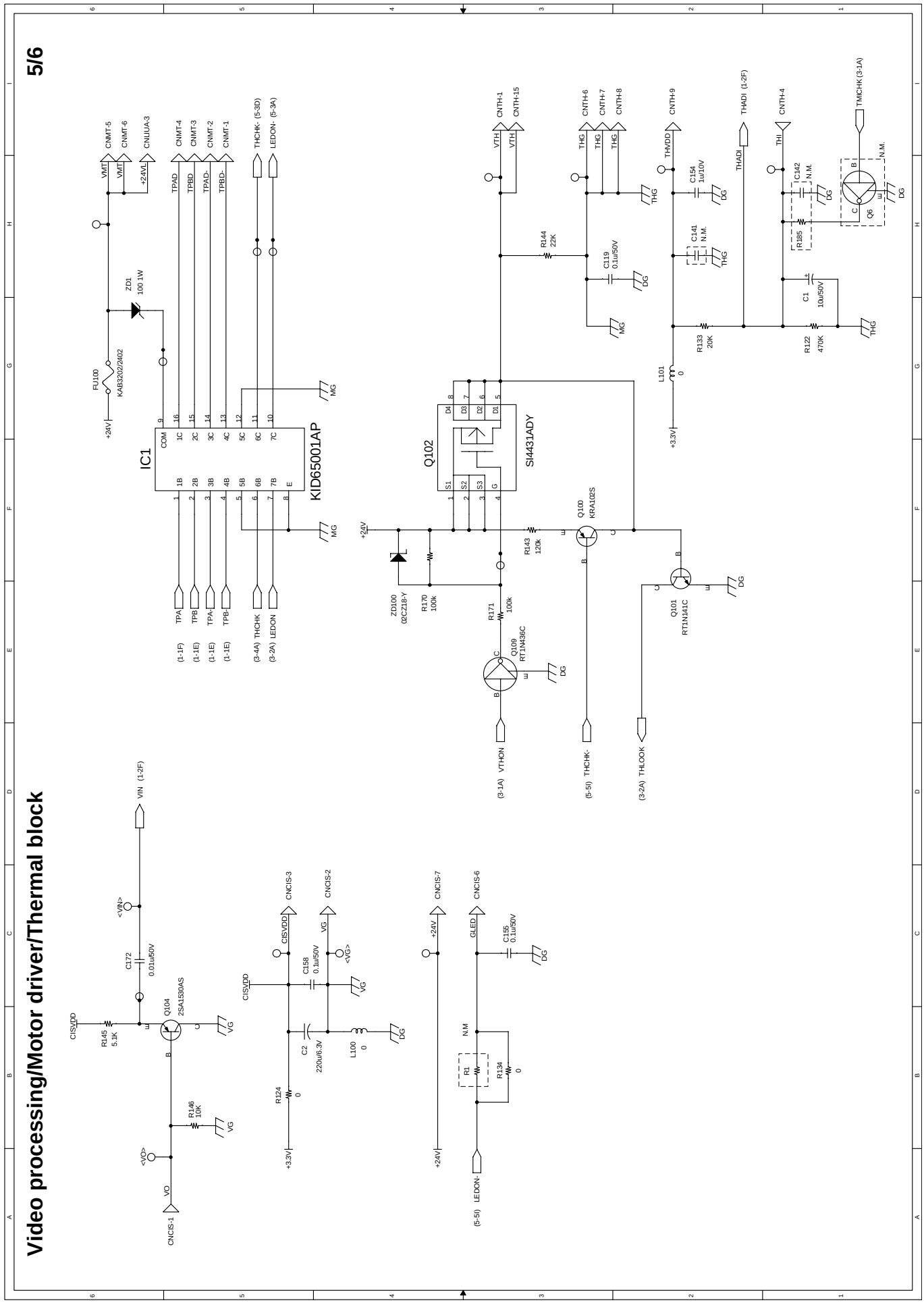


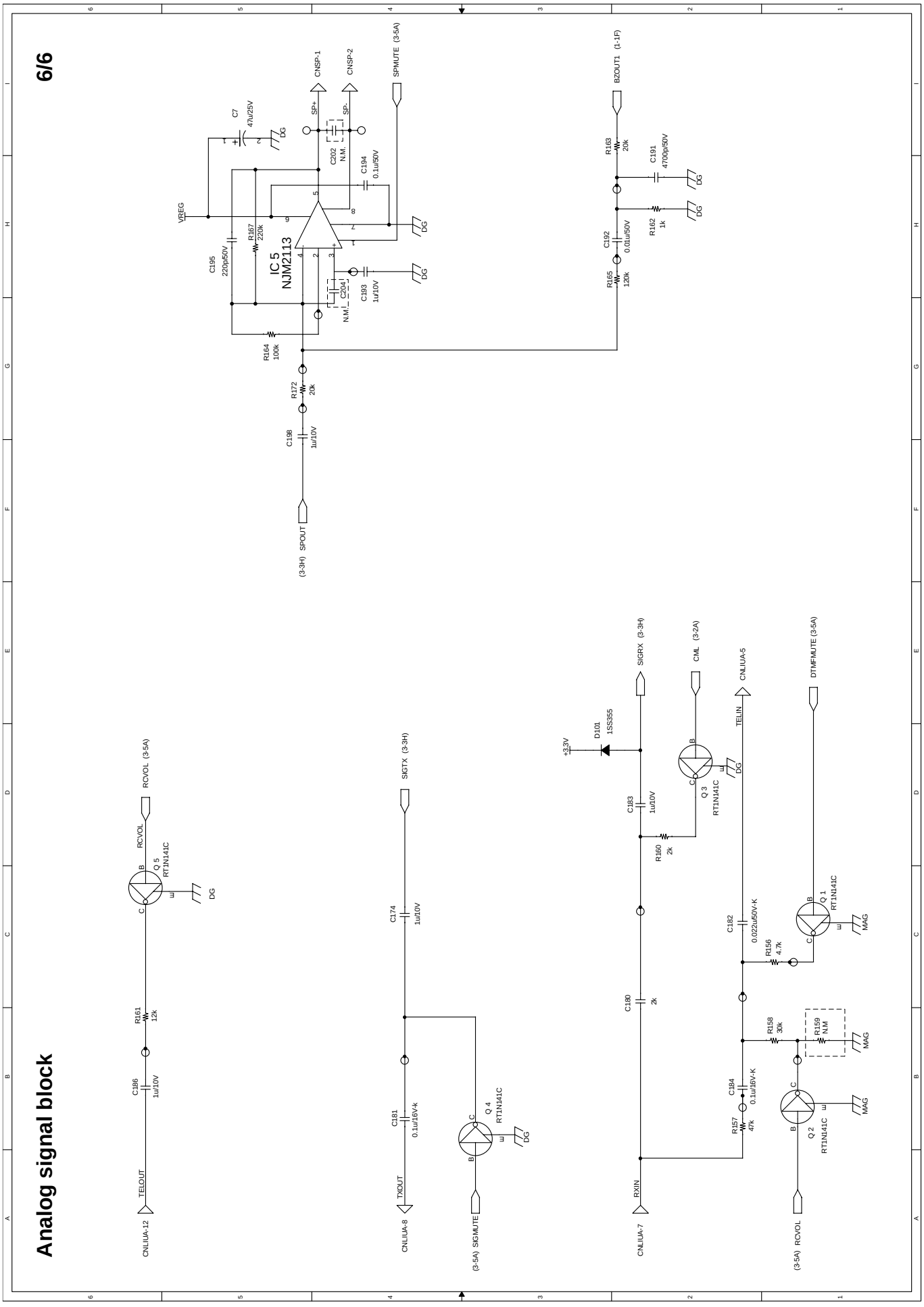

2/6
Memory block
IC3
MSM51V4800E
DRAM
IC4
SST39VF020P
FLASH
C144
0.1u/50V
C159
N.M.
C175
0.1u/50V
R183
N.M.
R182
R136
N.M.
R138
N.M.
R111
10k
R147
10k
R150
0
+3.3V
DG
RAS-
CAS-
DWR-
(1-5I) A[18:0]
(1-6I) D[7:0]
(1-3I) ROMCS-
(1-4I) WR-
(1-4I) RD-


Modem block
3/6
IC2
SCE209(2/2)
MODEM BLOCK
SIGRX (6-2E)
SIGTX (6-4D)
SPOUT (6-4F)
SPMUTE
SIGMUTE
DTMFMUTE
RCVOL
TELMUTE
THRANK
DPMUTE
LEDON
VTHON
PSAVE
FLTXD
FLRXD
THLOOK
THICHK
MICMUTE
SASTXD
SASRXD
SASCLK2[GPIO5]
DSS_PARK[GPIO10]
SASTXD2[GPIO4]
SASRXD2[GPIO7]
MAG
DG
N.M.

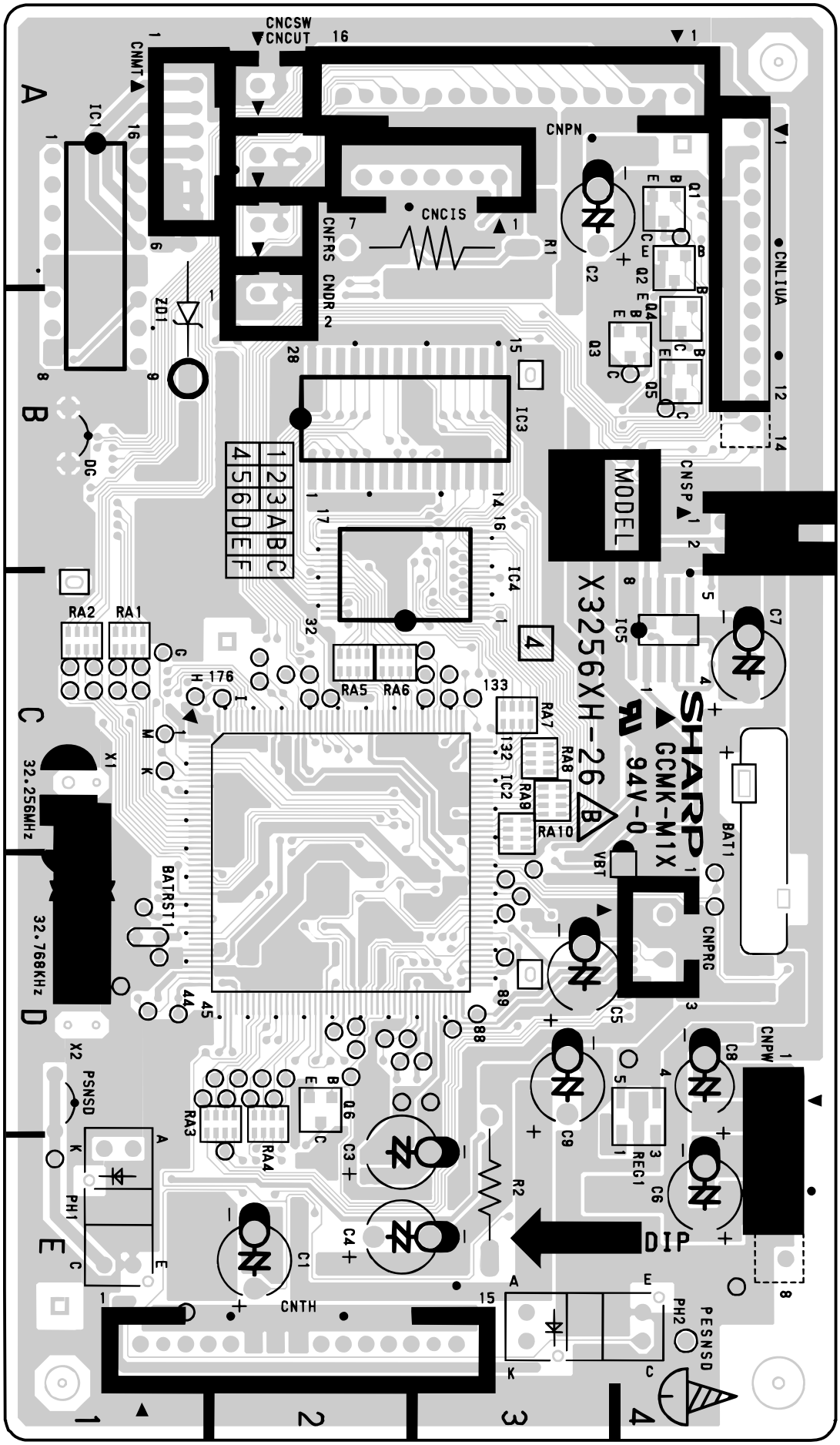


	FO-71	FO-51
R109*	270Ω	N.M.
R110*	N.M.	0Ω
R139*	270Ω	N.M.
C143*	470pF/50V	N.M.
C162*	1000pF/50V	N.M.
PH1*	SG206S	N.M.
CNCUT*	QCNCM7014SC0C	N.M.

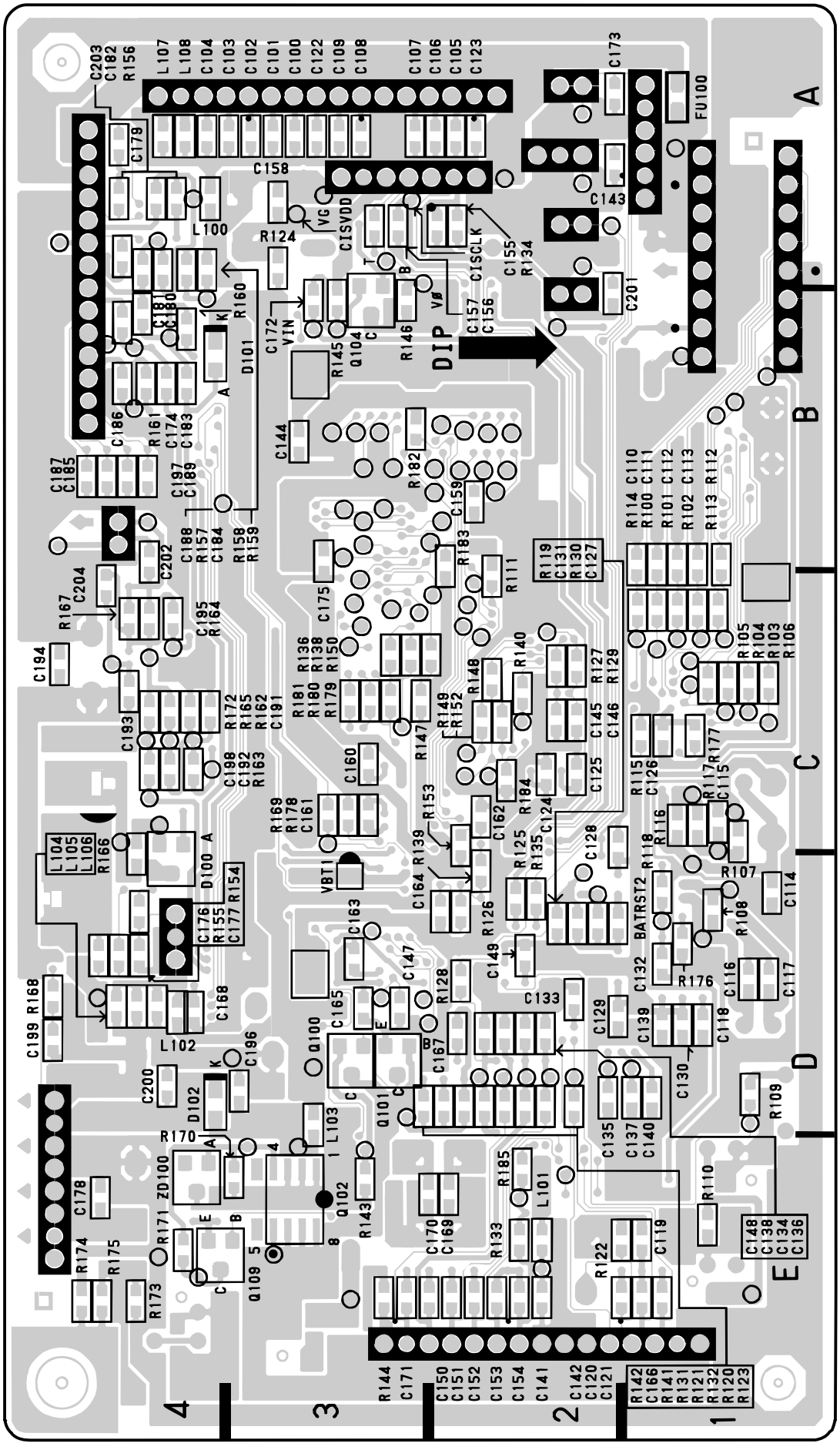

5/6
Video processing/Motor driver/Thermal block
IC1
KID65001AP
Q102
SI4431ADY
Q104
2SA1530AS
Q100
KRA102S
Q101
RT1N141C
Q109
RT1N436C
ZD1
100 1W
ZD100
02CZ18-Y
FU100
KAB3202/2402
L101
L100
R144 22K
R143 120k
R171 100k
R170 100k
R145 5.1K
R146 10K
R124 0
R134 0
R133 20K
R122 470K
C119 0.1u/50V
C154 1u/10V
C141 N.M.
C142 N.M.
C1 10u/50V
C172 0.01u/50V
C158 0.1u/50V
C2 220u/6.3V
C155 0.1u/50V
R185
R1
CNMT-5
CNMT-6
CNUUA-3
CNMT-4
CNMT-3
CNMT-2
CNMT-1
THCHK- (5-3D)
LEDON- (5-3A)
CNTH-1
CNTH-15
CNTH-6
CNTH-7
CNTH-8
CNTH-9
THADI (1-2F)
CNTH-4
TMCHK (3-1A)
VIN (1-2F)
CNCIS-1
CNCIS-2
CNCIS-3
CNCIS-6
CNCIS-7
TPA (1-1F)
TPB (1-1E)
TPA- (1-1E)
TPB- (1-1E)
THCHK (3-4A)
LEDON (3-2A)
VTHON (3-1A)
THCHK- (5-5I)
THLOOK (3-2A)
LEDON- (5-5I)
+24V
+3.3V
VG
DG
MG
THG
VTH
THI
THADI
GLED
N.M
VIN
VO

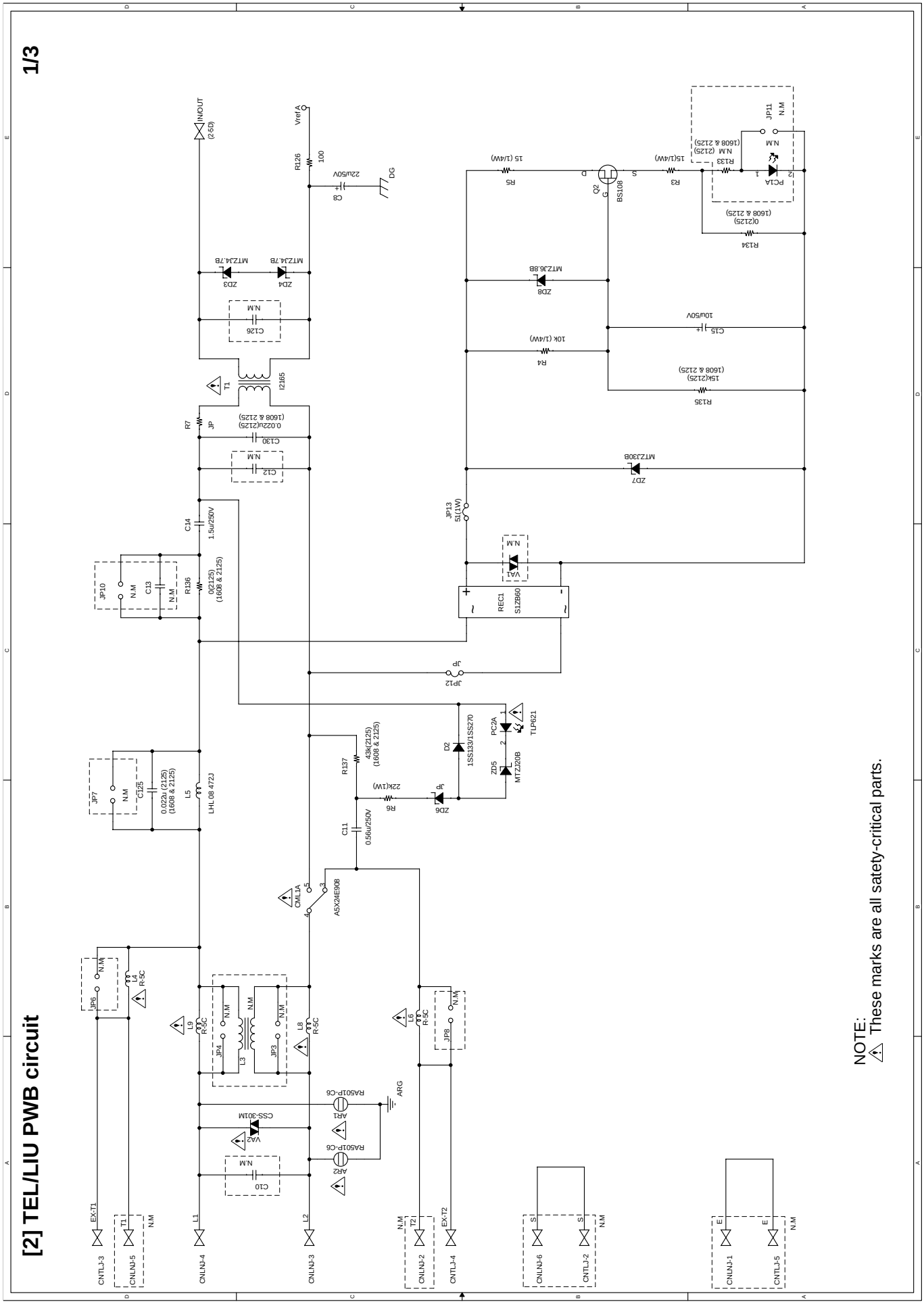

6/6
Analog signal block
IC 5
NJM2113
VREG
C7
4.7u/25V
C195
220p/50V
R167
220k
C202
N.M.
C194
0.1u/50V
C204
N.M.
C193
1u/10V
R164
100k
R172
20k
C198
1u/10V
SPOUT
(3-3H)
CNSP-1
CNSP-2
SP+
SP-
SPMUTE (3-5A)
BZOUT1 (1-1F)
R163
20k
C191
4700p/50V
R162
1k
C192
0.01u/50V
R165
120k
RCVOL (3-5A)
RCVOL
Q 5
RT1N141C
R161
12k
C186
1u/10V
TELOUT
CNLIUA-12
SIGTX (3-3H)
C174
1u/10V
C181
0.1u/16V-k
TXOUT
CNLIUA-8
Q 4
RT1N141C
(3-5A) SIGMUTE
+3.3V
D101
1SS355
SIGRX (3-3H)
CML (3-2A)
C183
1u/10V
R160
2k
Q 3
RT1N141C
TELIN
CNLIUA-5
C180
2k
RXIN
CNLIUA-7
C182
0.022u/50V-K
R156
4.7k
R158
30k
R159
N.M
C184
0.1u/16V-K
R157
47k
Q 2
RT1N141C
Q 1
RT1N141C
DTMFMUTE (3-5A)
MAG
(3-5A) RCVOL
DG

Control PWB parts layout (Top side)



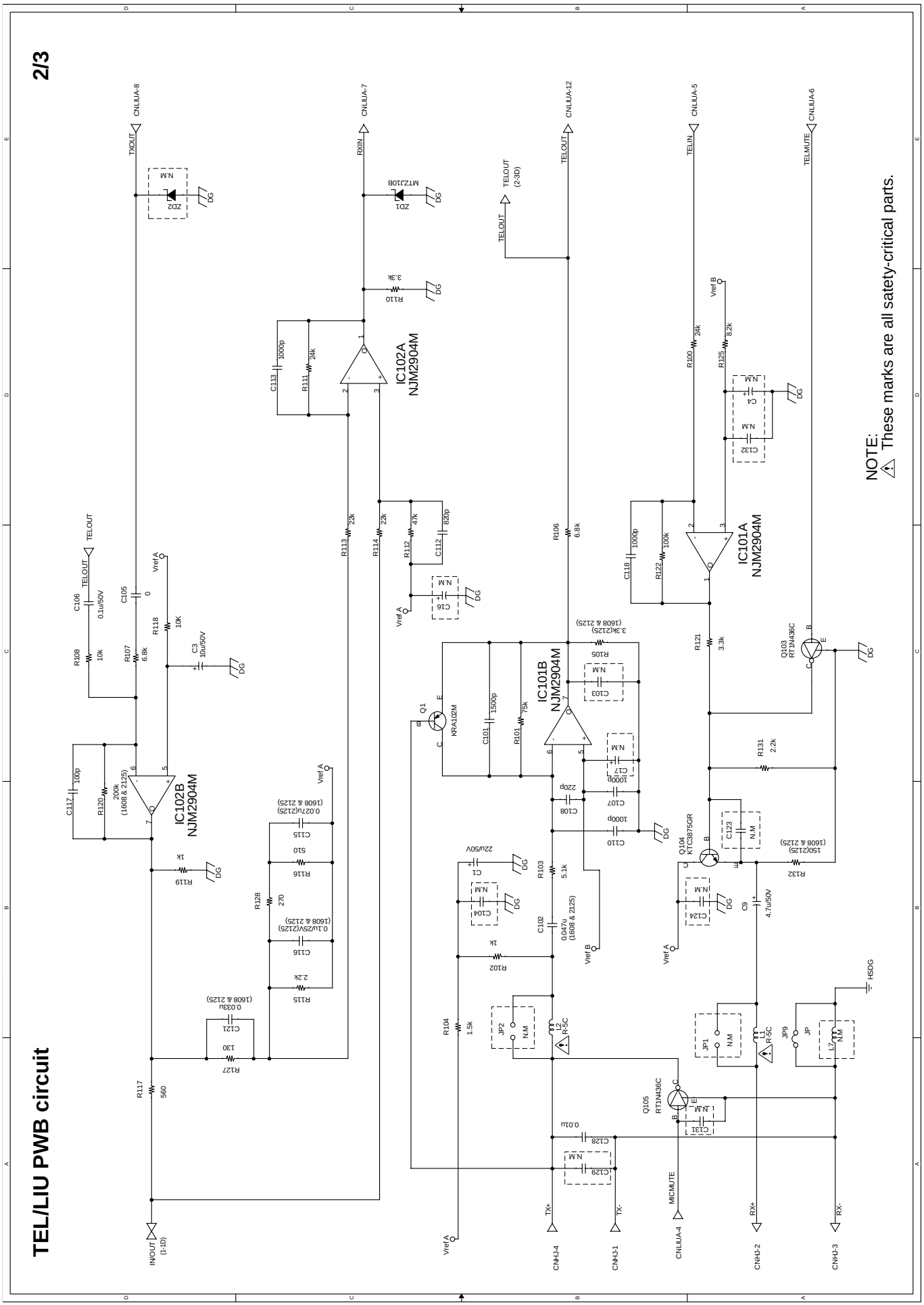
Control PWB parts layout (Bottom side)

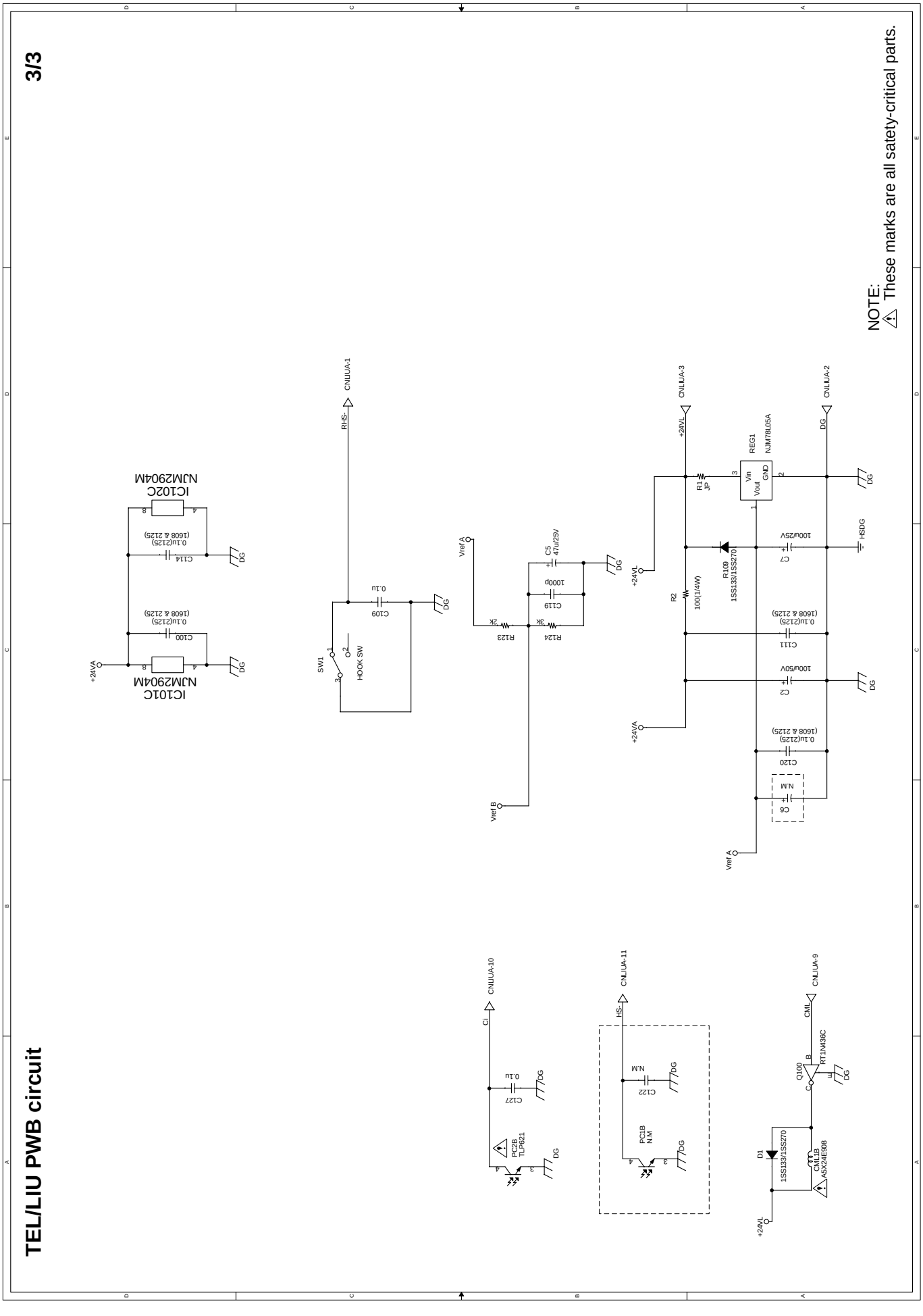



1/3
[2] TEL/LIU PWB circuit
NOTE:
⚠ These marks are all satety-critical parts.

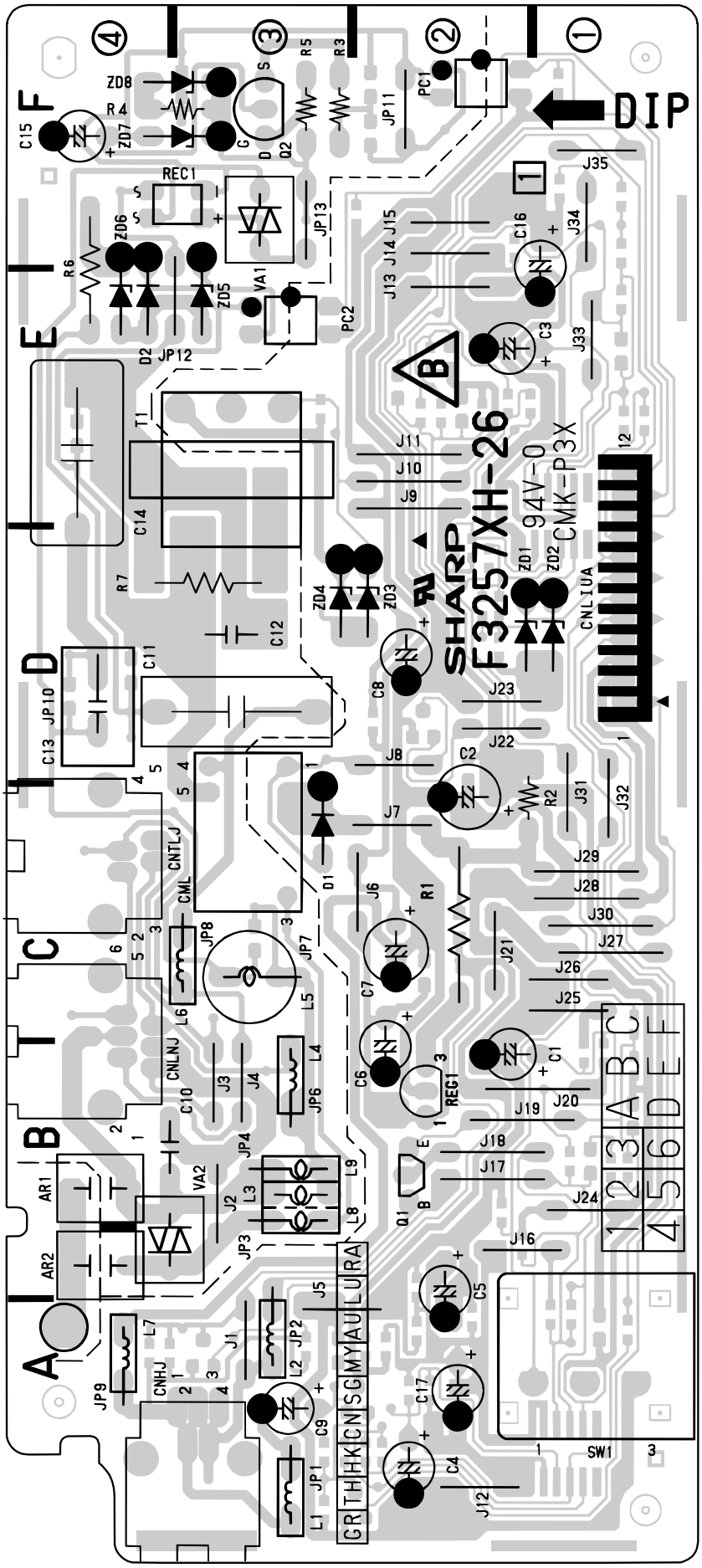
TEL/LIU PWB circuit

2/3

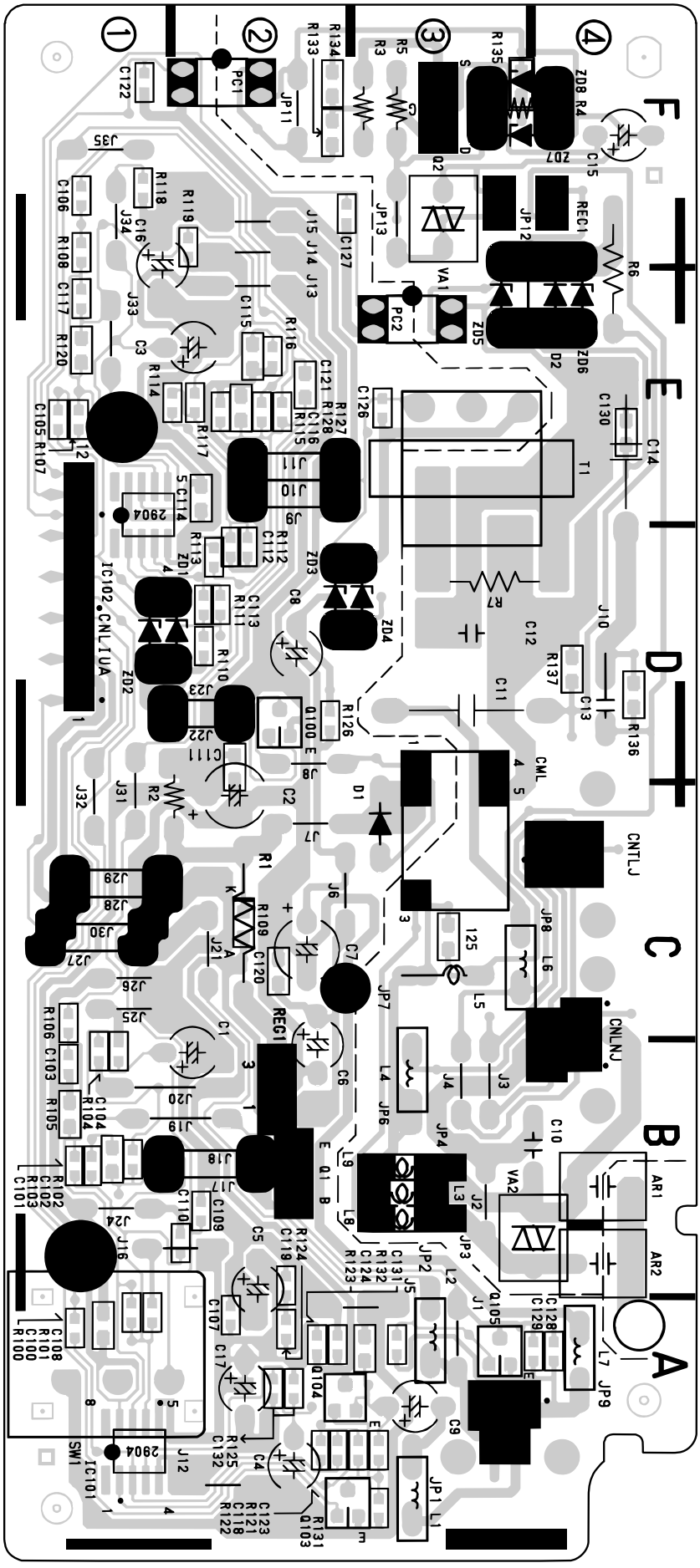



TEL/LIU PWB circuit
3/3
NOTE:
⚠ These marks are all satety-critical parts.
CNLIUA-1
RHS
SW1
HOOK SW
C109
0.1u
DG
CNLIUA-3
+24VL
REG1
NJM78L05A
Vin
Vout
GND
R1
JP
C7
100u/25V
HSDG
R109
1SS133/1SS270
R2
100(1/4W)
C111
0.1u(2125)
(1608 & 2125)
C2
100u/50V
C120
C6
N.M
+24VA
Vref A
Vref B
C5
47u/25V
C119
1000P
R123
2k
R124
3k
CNLIUA-2
IC101C
NJM2904M
IC102C
C100
C114
+24VA
CNLIUA-10
CI
C127
PC2B
TLP621
CNLIUA-11
HS
C122
PC1B
N.M
CNLIUA-9
CML
Q100
RT1N436C
D1
1SS133/1SS270
CML1B
A5X24E908
+24VL

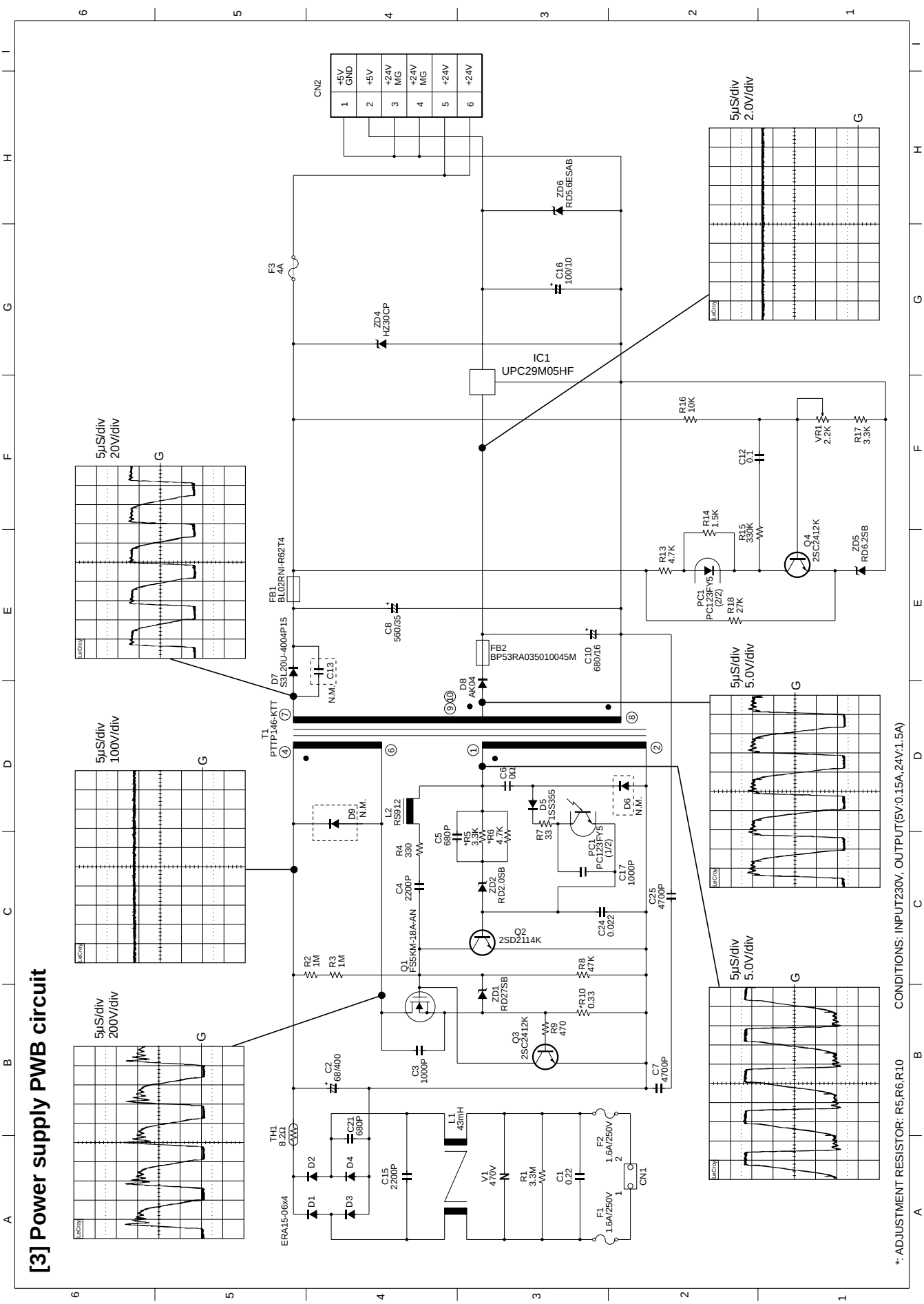
TEL/LIU PWB parts layout (Top side)



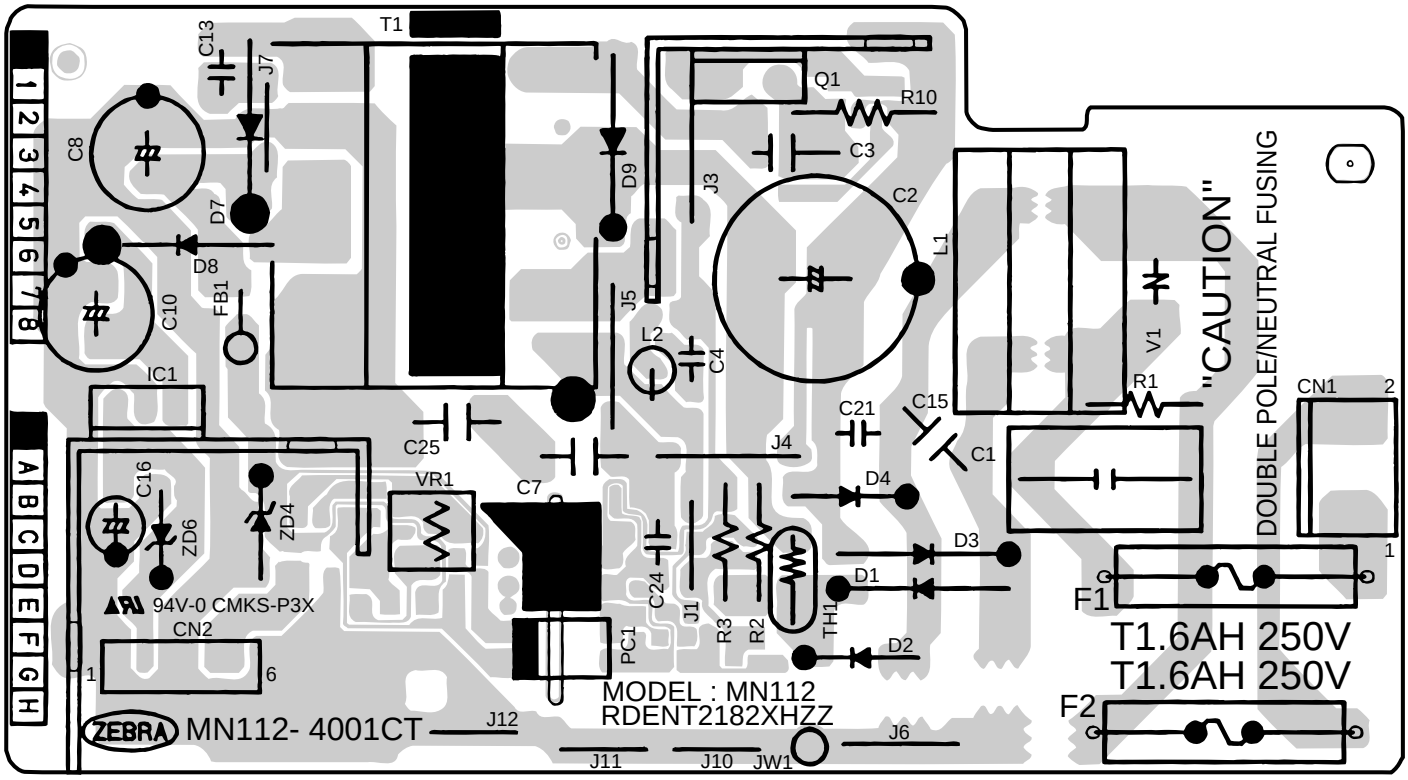
TEL/LIU PWB parts layout (Bottom side)



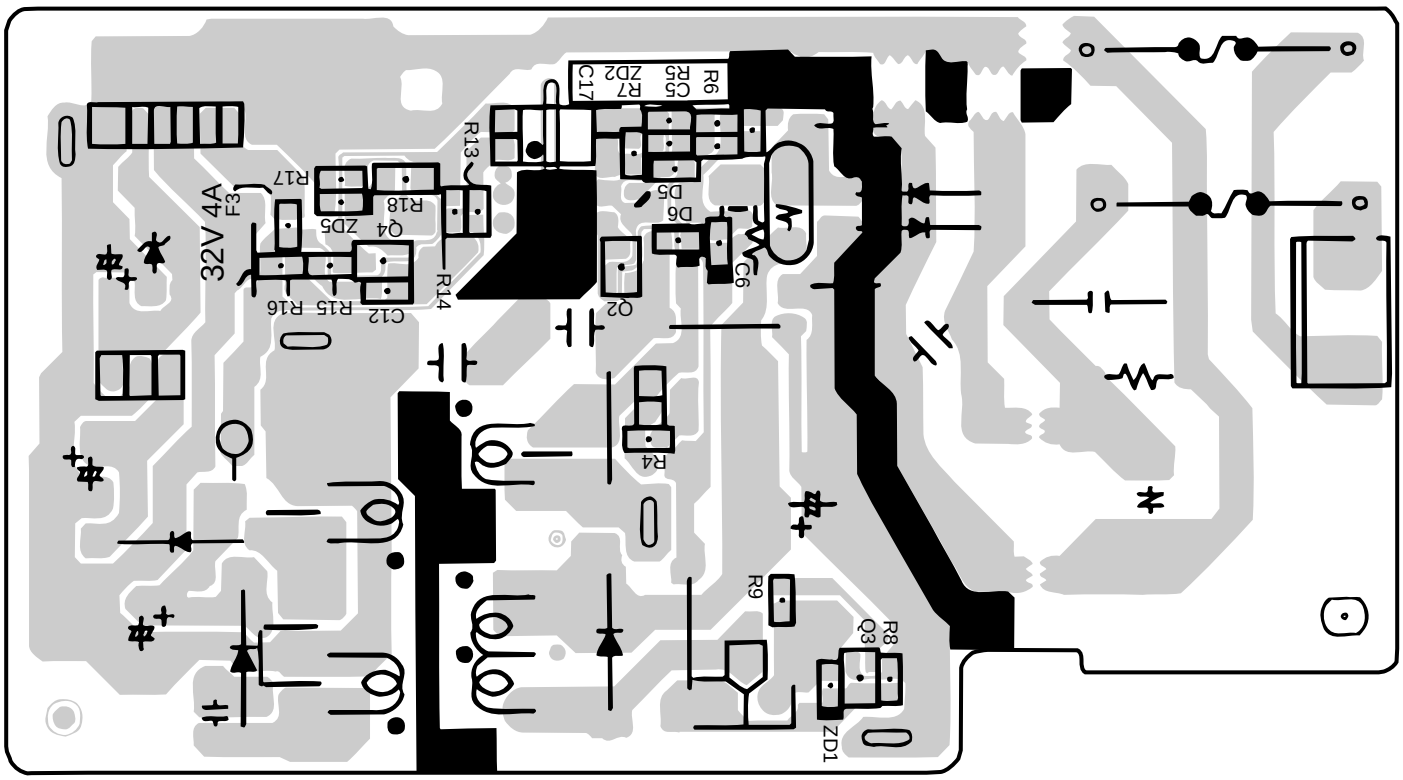
[3] Power supply PWB circuit

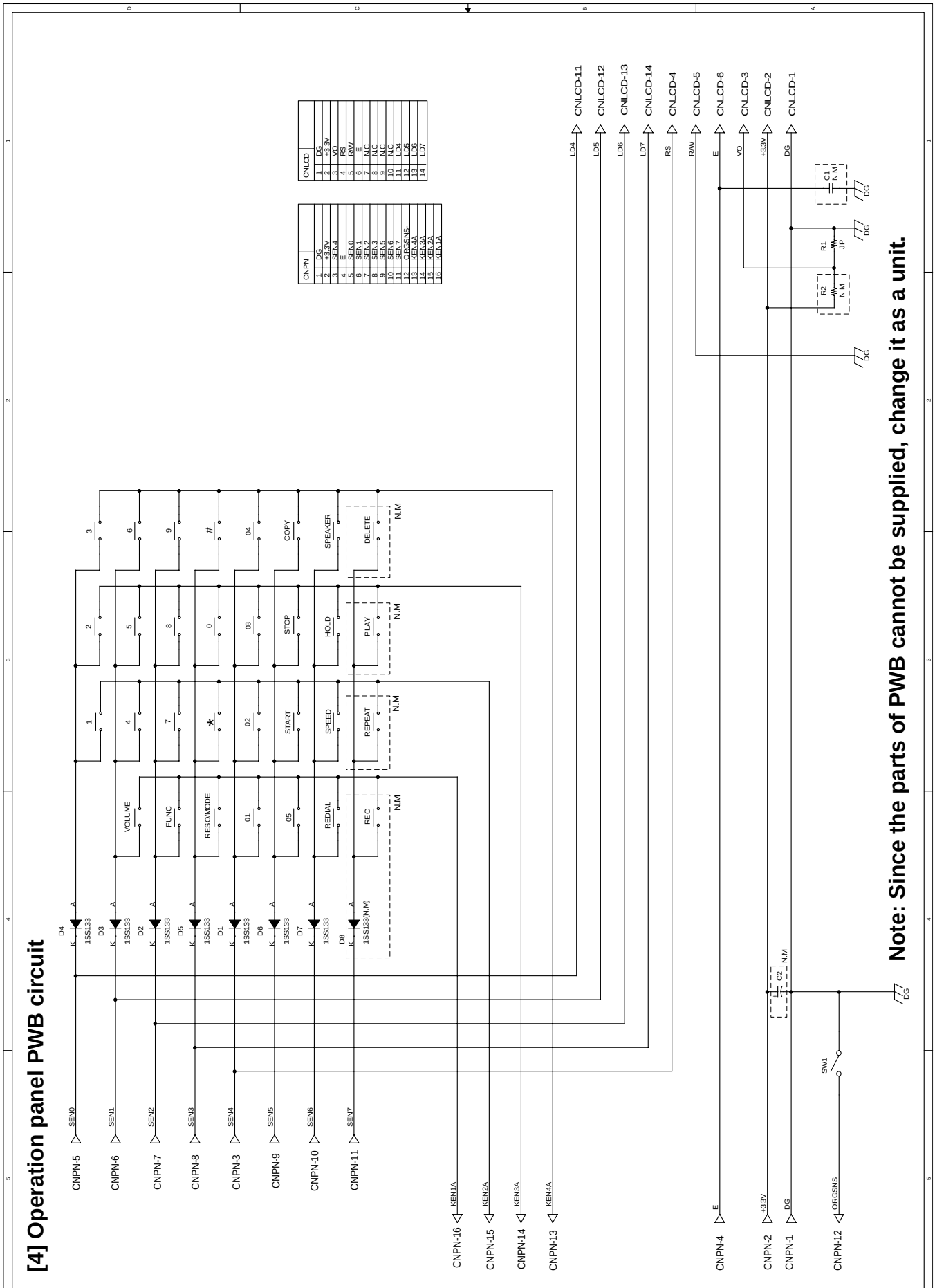


Power supply PWB parts layout (Top side)



Power supply PWB parts layout (Bottom side)

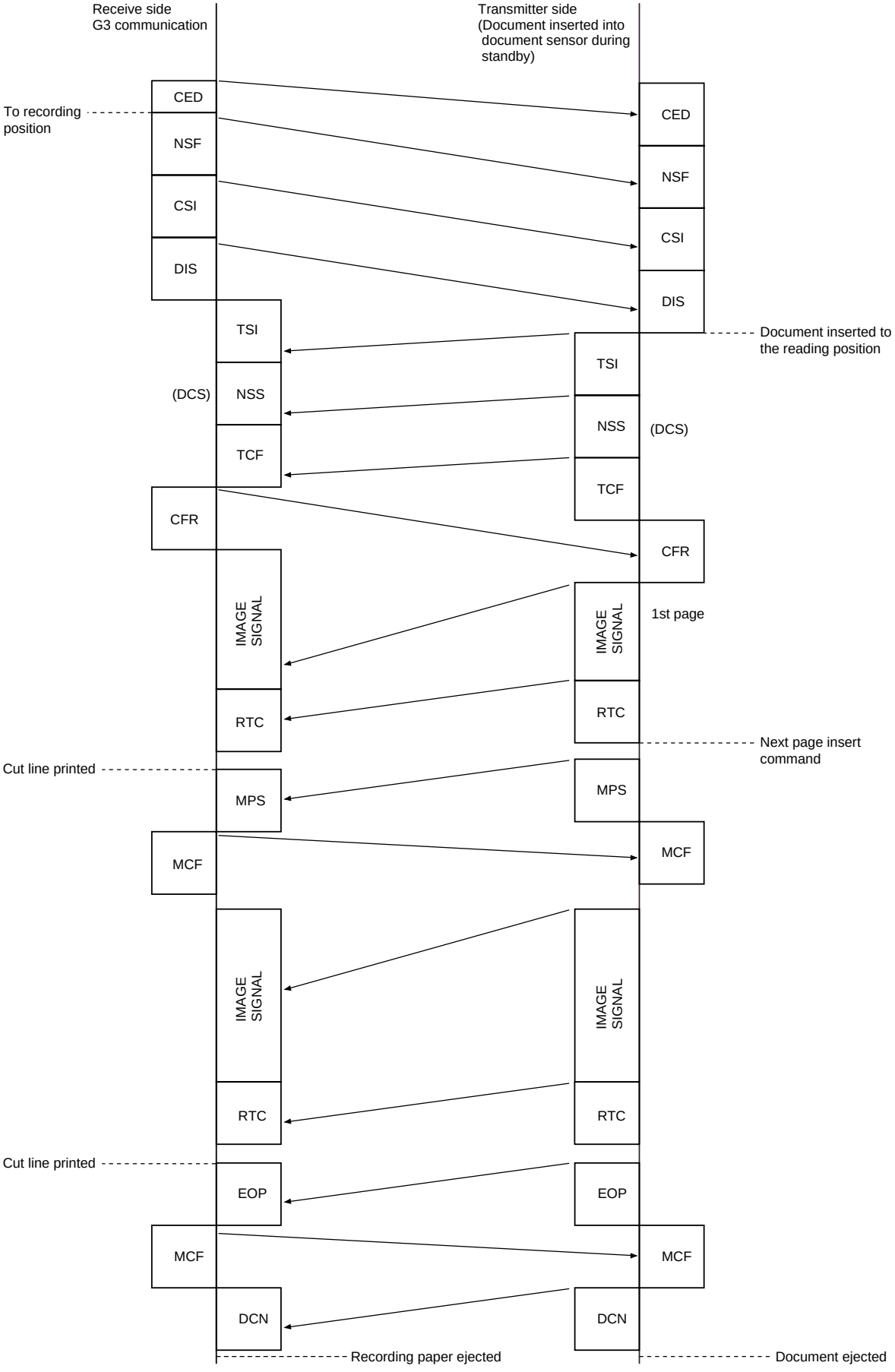




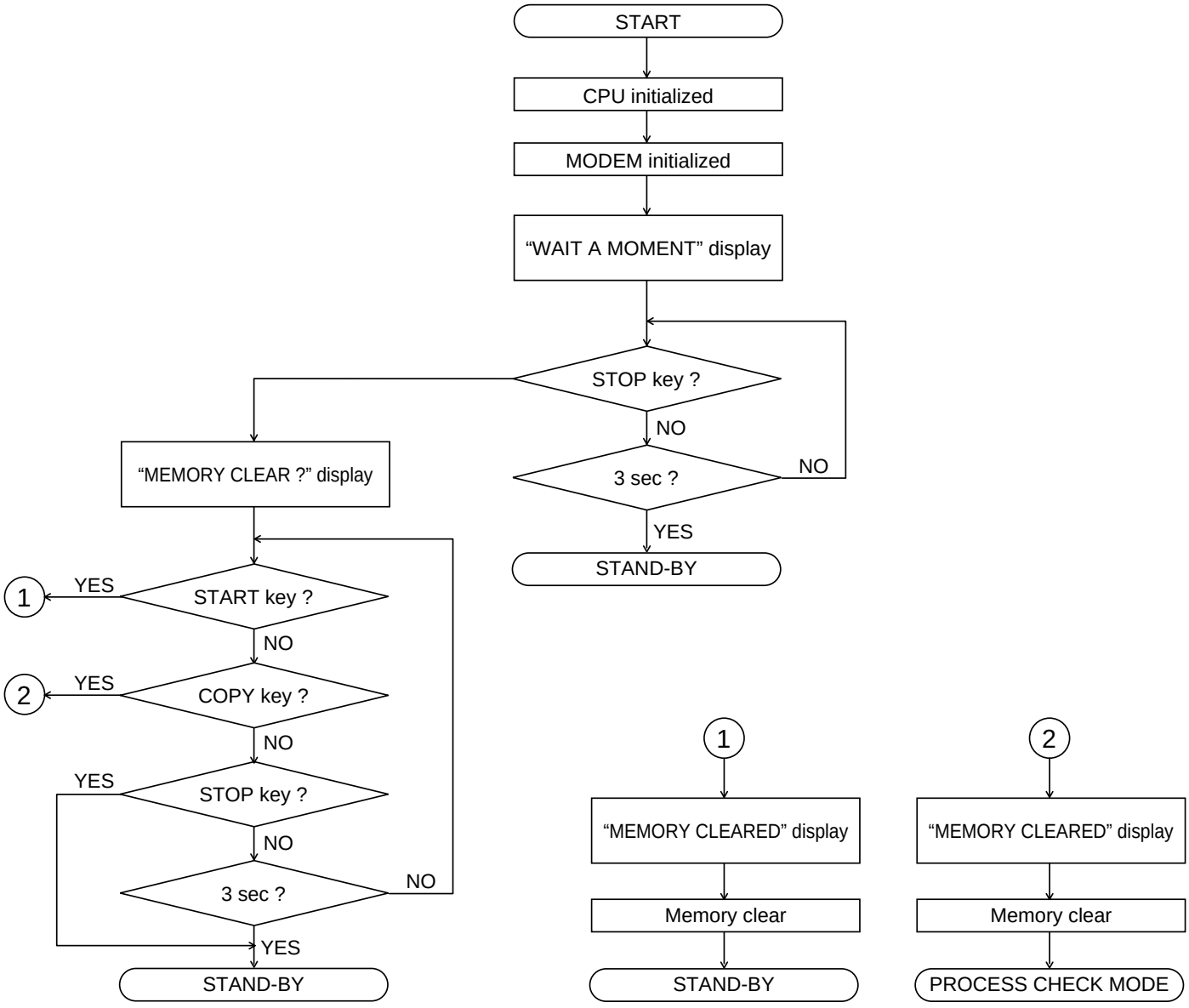
Note: Since the parts of PWB cannot be supplied, change it as a unit.

CHAPTER 7. OPERATION FLOWCHART

[1] Protocol



[2] Power on sequence



CHAPTER 8. OTHERS

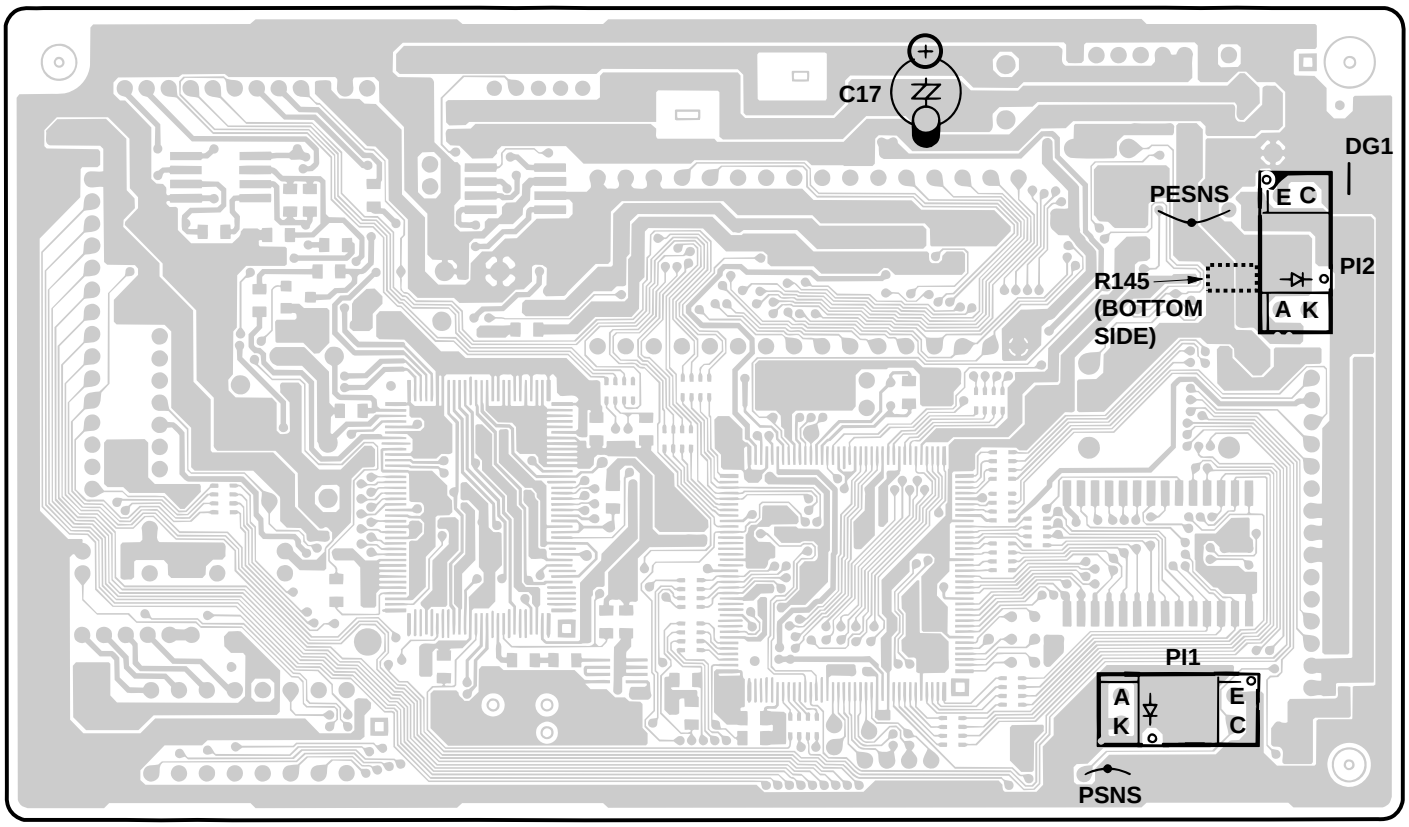
[1] Service tools

1. List

NO.	PARTS CODE	DESCRIPTION	Q'TY	PRICE RANK
1	DKiT-216CSC02	Control PWB and Extension cable unit	1	BP
2	PSHEZ3579SCZZ	Shading wave memory standard paper	1	AD

Extension board unit

EXTENSION CONTROL PWB



NO.	PARTS CODE	DESCRIPTION	Q'TY	PRICE RANK
1	CCNW–4756SC01	SPEAKER RELAY CABLE	1	AK
2	CCNW–4758SC01	CIS RELAY CABLE	1	AQ
3	QCNWG205BSCZZ	HEAD RELAY CABLE	1	AS
4	CCNW–4760SC01	CAM SWITCH RELAY CABLE	1	AK
5	CCNW–4761SC01	FRONT SENSOR RELAY CABLE	1	AK
6	CCNW–4763SC01	MOTOR RELAY CABLE	1	AP
7	QCNW–4969SCZZ	SENSOR RELAY CABLE	1	BF
8	CCNW–274ASC01	PANEL RELAY CABLE	1	AU
9	CCNW–276ASC01	DOOR SWITCH RELAY CABLE	1	AH
10	CCNW–275ASC01	CUTTER RELAY CABLE	1	AL
11	CPWBS3045SCS1	Extension Control PWB unit [R145 / PI1 / PI2]	1	AR
12	VRS–TS2AD102J	RESISTOR (1/10W 1KΩ ±5%)[R145]	1	AA
13	VHPSG206S//–1	PHOTO TRANSISTOR [PI1]	1	AG
14	VHPSG206S//–1	PHOTO TRANSISTOR [PI2]	1	AG

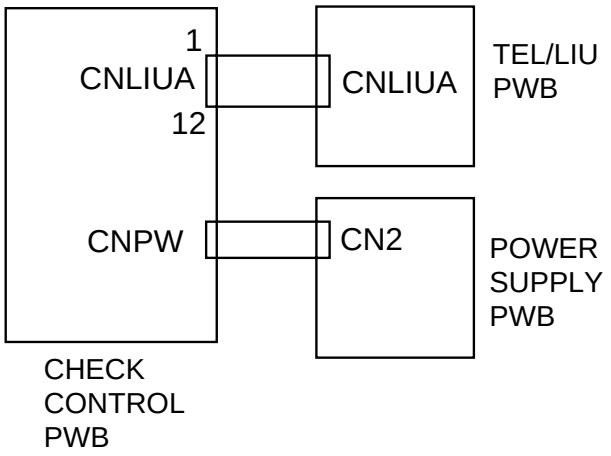
2. Description

2-1. Relay board unit

1. Remove the TEL/LIU PWB, control PWB and Power Supply PWB from this unit, and mount the relay board unit instead.
   - Before connecting the wiring to the relay board unit, set the test PWB switches to the fixed position.
2. The setting is as follows.

Relay cable

- The relay cables are used as one pair.
- The cover swich and hook switch are manually operated.

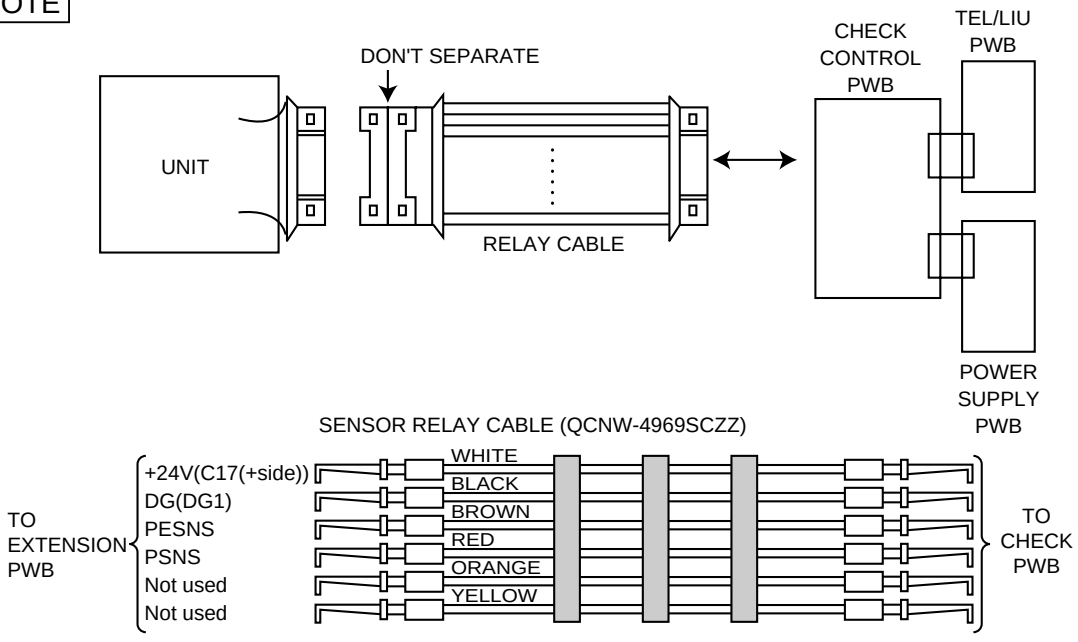


The recording paper sensor (PI1) and the hook switch are operated by the mechanical unit switch and the test PWB switch. When performing installation in the machine unit, set the test PWB switches to the fixed position.

	Mechanical unit	PWB to be tested
	Actual operation with mechanical unit	
Recording paper sensor	ON/OFF operation	OFF (Photo interrupter is interrupted.)
Hook SW	ON/OFF operation	ON-HOOK
	PWB sensor check	
Recording paper sensor	OFF	ON/OFF operation
Hook SW	ON-HOOK	ON/OFF operation

* Recording paper: ON
No recording paper: OFF

NOTE



3. Shading paper

The white and black basis is applied to remember the shading waveform. Be sure to perform this operation when replacing the battery or replacing the control PWB. Execute in the shading mode of DIAG mode.

SHADING WAVE MEMORY STANDARD PAPER (PSHEZ3579SCZZ)

[2] Rewriting version up the FLASH ROM

Step 1 File setting ①
Execute “FAX_LOADER.EXE” and extract the compressed file.

File contents:

```
¥FAX_LOADER¥----+----¥CMD¥-----+---- Atl0.cmd
                |               |
                ----+----¥CONFIG¥--+---- FAX_DOWNLOAD.txt
                |               |
                ----+----¥DATA¥----+---- ¥FAX¥
```

Step 2 File setting ②
Copy the downloaded file (※.VER) to ¥FAX_LOADER¥DATA¥FAX¥ in the default directory (given directory).

Step 3 Flash rewriting
Description for application is detailed in the attached document below.
· Rewriting the flash for the FAX engine (with software (Tera Term) for the PC)

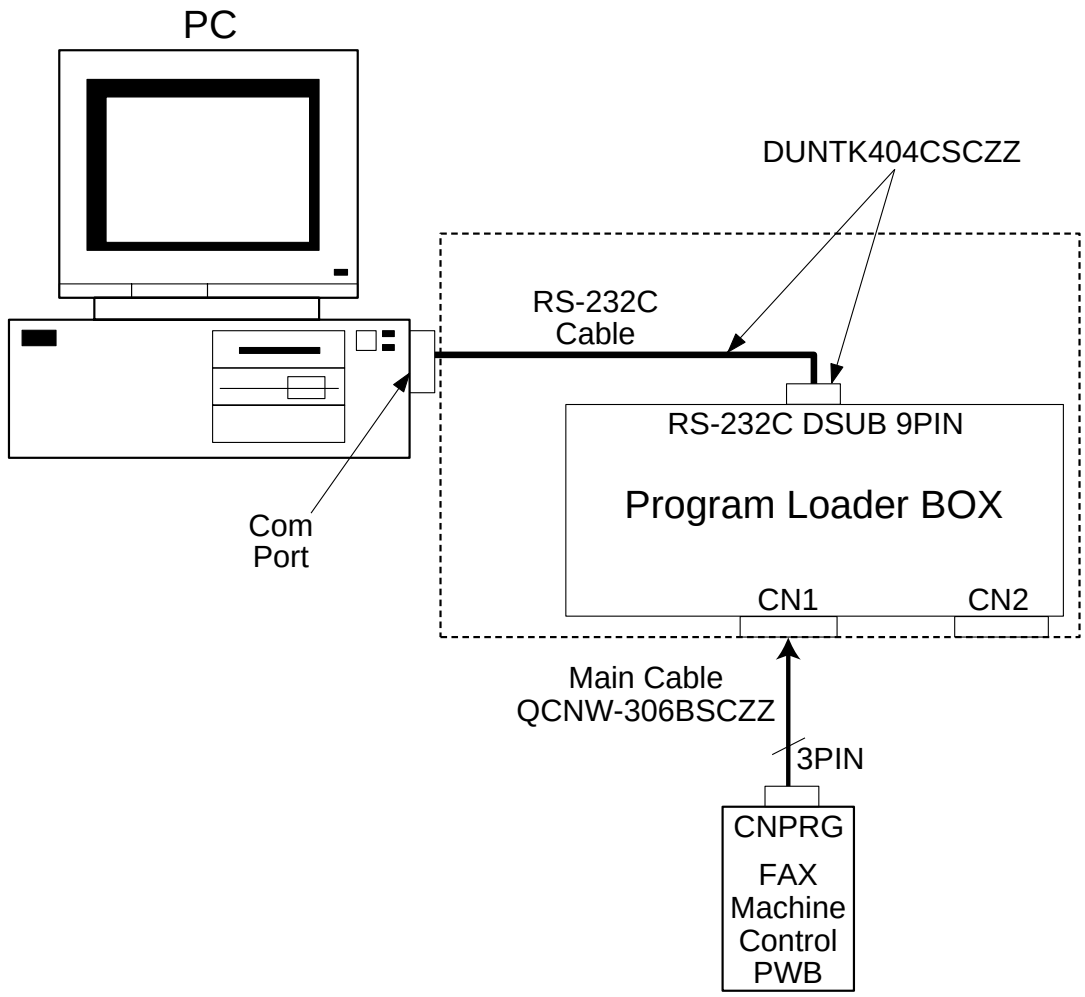


Fig. 1. Connected chart

PART CORD	PRICE RANK	NAME	REMARKS
DUNTK404CSCZZ	DG	Program loader BOX	Includes RS-232C cable
QCNW-306BSCZZ	BF	Main cable	Connects Program loader BOX and FAX machine.

Table 1. Program loader unit

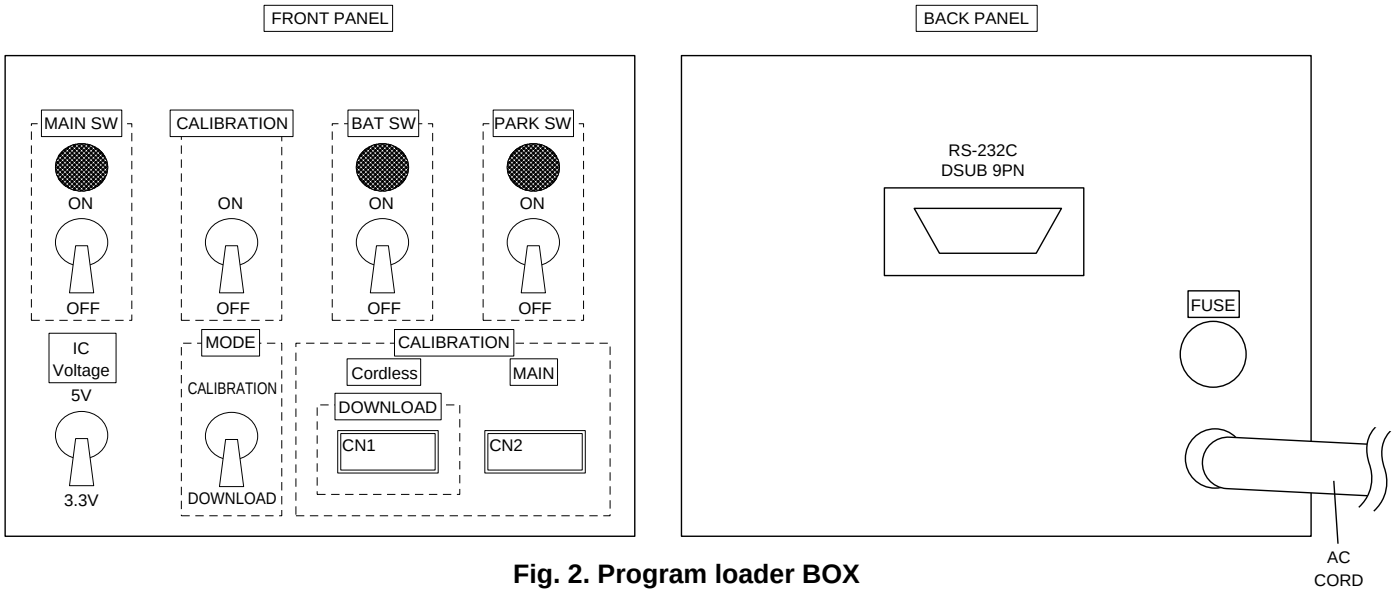


Fig. 2. Program loader BOX

	① Before connecting the PC and Program loader BOX with RS-232C cable.	② After connecting the PC and Program loader BOX with RS-232C cable. (1*)	③ Power supply to the FAX machine.	④ Connect Program loader BOX and the Control PWB of the FAX machine (CNPRG) with Main cable. (3*)
FAX PWB rewriting	Set the switches of Program loader BOX as follows. (a) MAIN SW OFF (down) (b) CALIBRATION OFF (down) (c) BATSW OFF (down) (d) PARK SW OFF (down) (e) IC Voltage to 3.3V (down) (f) MODE to DOWNLOAD (down)	Set the switch of Program loader BOX as follows. (g) MAIN SW ON (up)	Plug the power cable of the FAX machine to the outlet. (2*)	---

Table 2. Program loader BOX connection procedures

1*: Connect one end of RS-232C cable to the COM port of the PC and the other end to RS-232C DSUB 9PIN of Program loader BOX.

2*: Press and hold down the keys 1 and 3 simultaneously while turning on the FAX machine and until “DOWNLOAD MODE” appears.

3*: Perform the procedure ③ before ④. (Turn on the Program loader BOX and the FAX machine before connecting Main cable and the FAX machine.)
Connect one end of Main cable to the connector of the Control PWB connector for the FAX machine (CNPRG) (refer to Fig. 3), and the other end to CN1 of Program loader BOX.

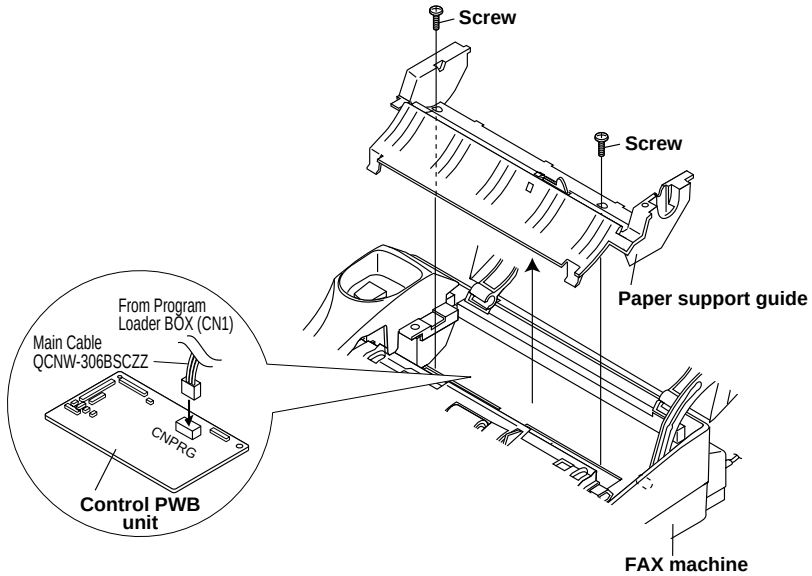


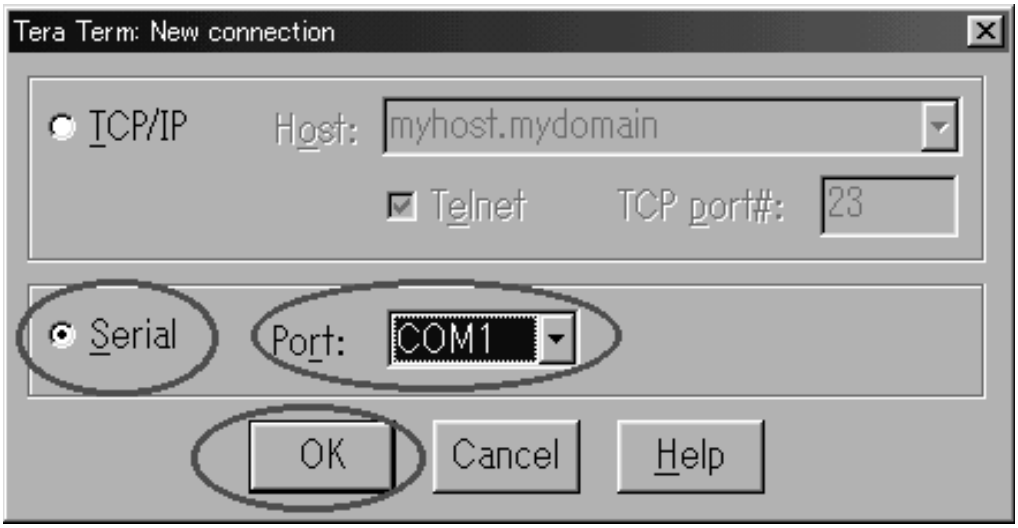
Fig. 3. Connection of Main cable

Using software for the PC (Tera Term)

Uncompress the compressed file of TeraTerm.
Execute the “SETUP.EXE” from compressed files to install TeraTerm.
Execute the “ttermpro.exe” to start Tera Term.

1. Select “New connection” from the pull-down menu of “File”.

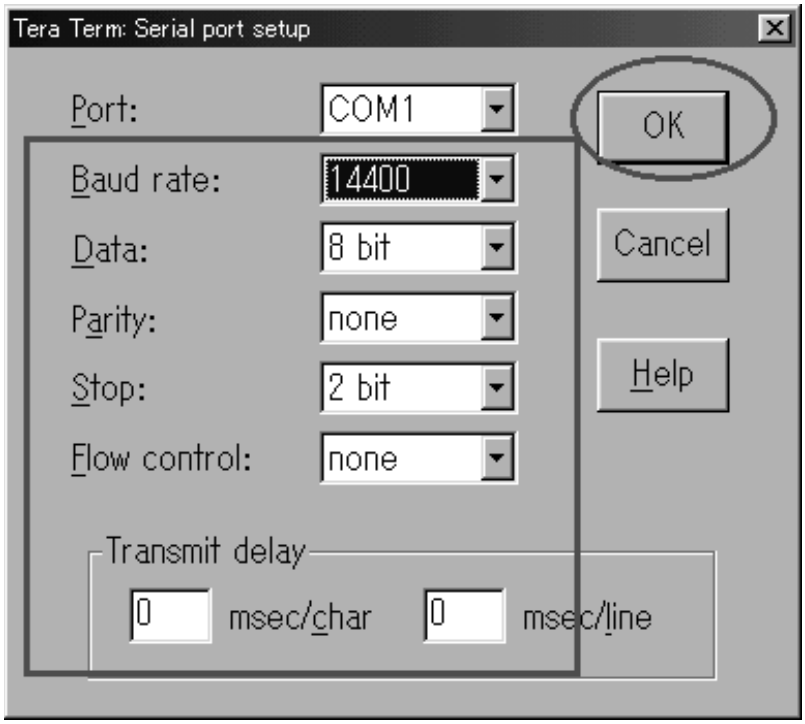
① Check “Serial”.
② Select the port number in which the RS-232C cable is connected to.
③ Click “OK” for confirmation.



↓
Proceed to 2.

2. Select “Serial port” from the pull-down menu of “Setup”.

Select the port number which the RS-232C cable is connected to.
Set the other parameters as follows and click “OK” for confirmation.



↓

Proceed to 3.

3. Perform procedures described in Table 3.

	① Before connecting the PC and Program loader BOX with RS-232C cable.	② After connecting the PC and Program loader BOX with RS-232C cable. (1*)	③ Power supply to the FAX machine.	④ Connect Program loader BOX and the Control PWB of the FAX machine (CNPRG) with Main Cable. (3*)
FAX PWB rewriting	Set the switches of Program loader BOX as follows. (a) MAIN SW OFF (down) (b) CALIBRATION OFF (down) (c) BATSW OFF (down) (d) PARK SW OFF (down) (e) IC Voltage to 3.3V (down) (f) MODE to DOWNLOAD (down)	Set the switch of Program loader BOX as follows. (g) MAIN SW ON (up)	Plug the power cable of the FAX machine to the outlet. (2*)	---

Table 3. Program loader BOX connection procedures

1*: Connect one end of RS-232C cable to the COM port of the PC and the other end to RS-232C DSUB 9PIN of Program loader BOX.
2*: Press and hold down the keys 1 and 3 simultaneously while turning on the FAX machine and until “DOWNLOAD MODE” appears.
3*: Perform the procedure ③ before ④. (Turn on the Program loader BOX and the FAX machine before connecting Main cable and the FAX machine.)
Connect one end of Main cable to the connector of the Control PWB connector for the FAX machine (CNPRG) (refer to Fig. 3), and the other end to CN1 of Program loader BOX.

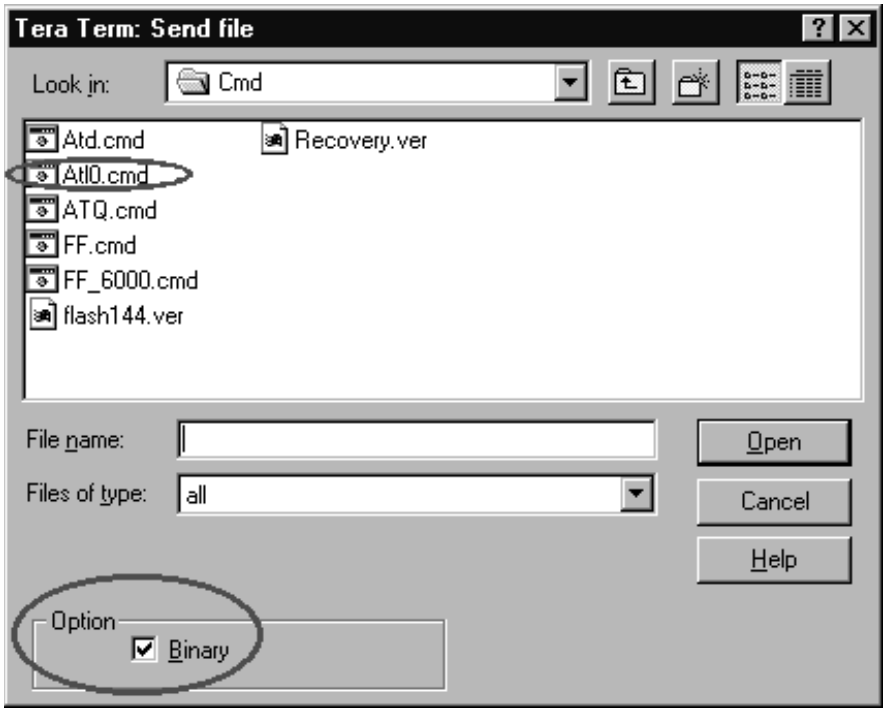
After performing procedures described in Table 3, press down the START key on the FAX machine.
“DOWNLOAD MODE WT” appears on the LCD.

↓

Proceed to 4.

4. Select “Send file” from the pull-down menu of “File”.

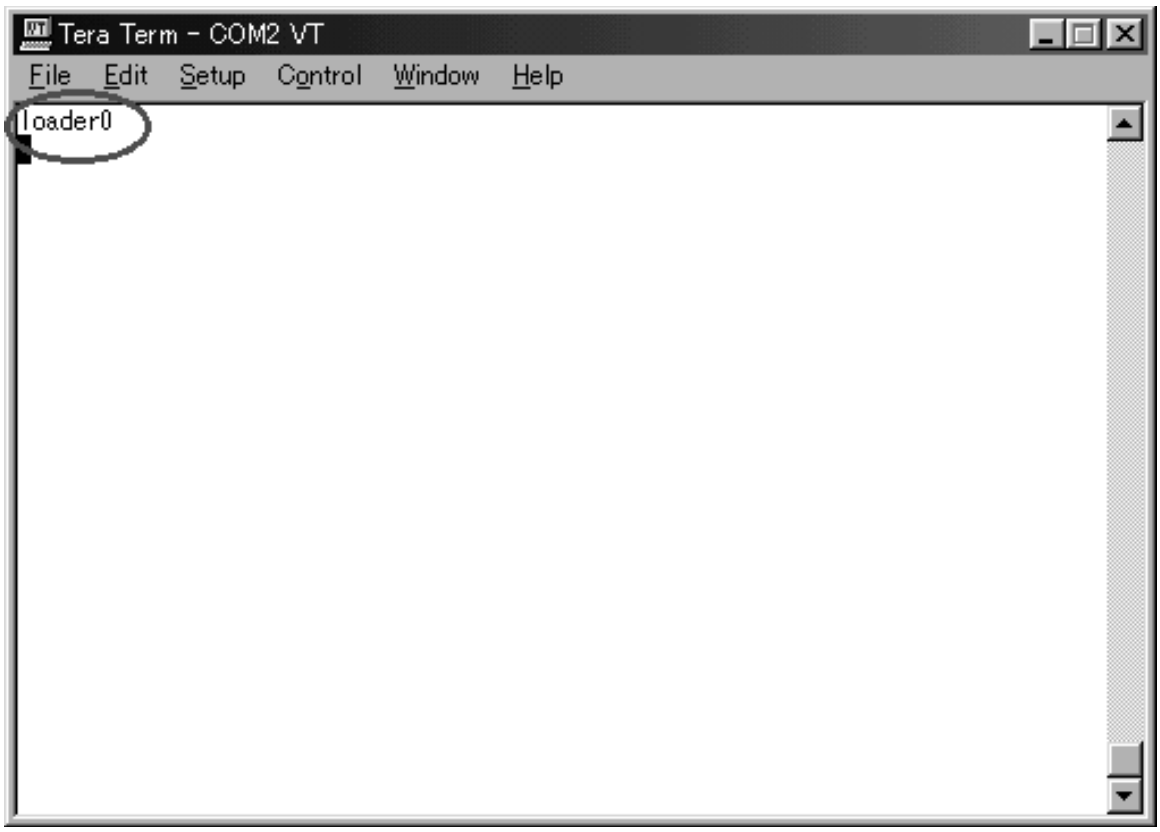
Enable the Binary in “Option” and open “Atl0. cmd”.



↓

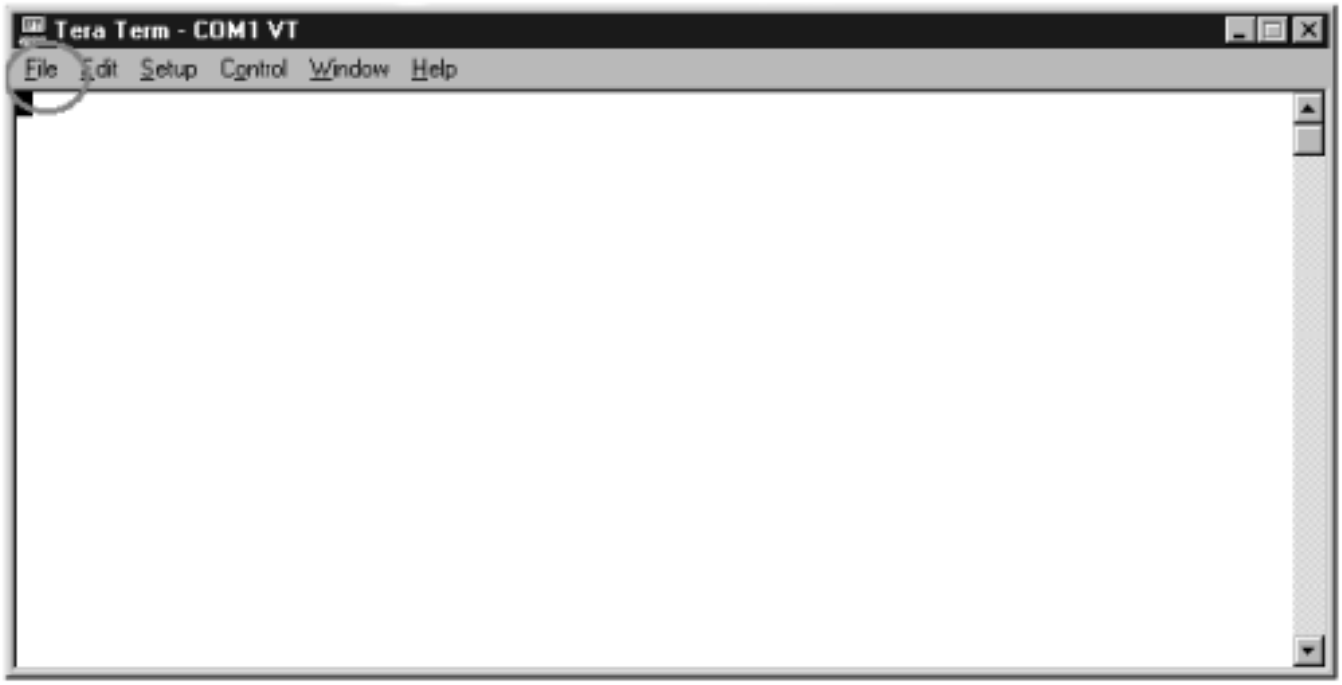
Proceed to 5.

5.

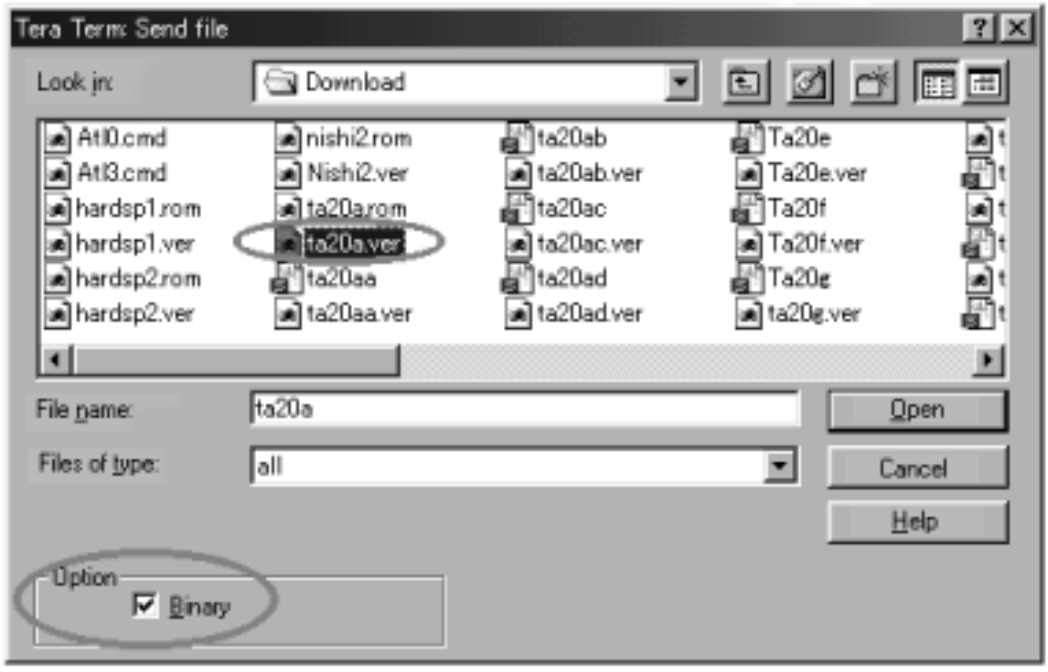


If the description above does not appear, return to 4.
If the description above appears, proceed to 6.

6. Select “Send file” from the pull-down menu of “File”.



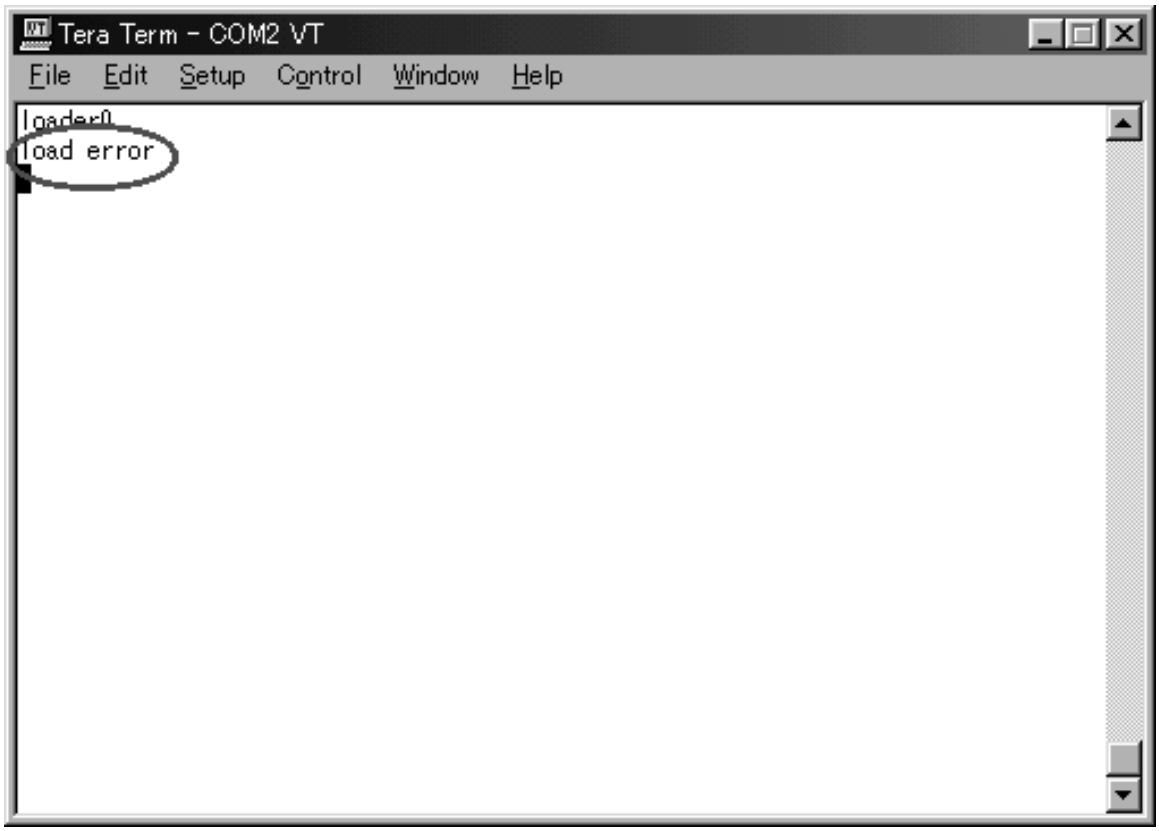
Enable the Binary in “Option” and open “ta*.ver”.
(Select a file you want to download here.)



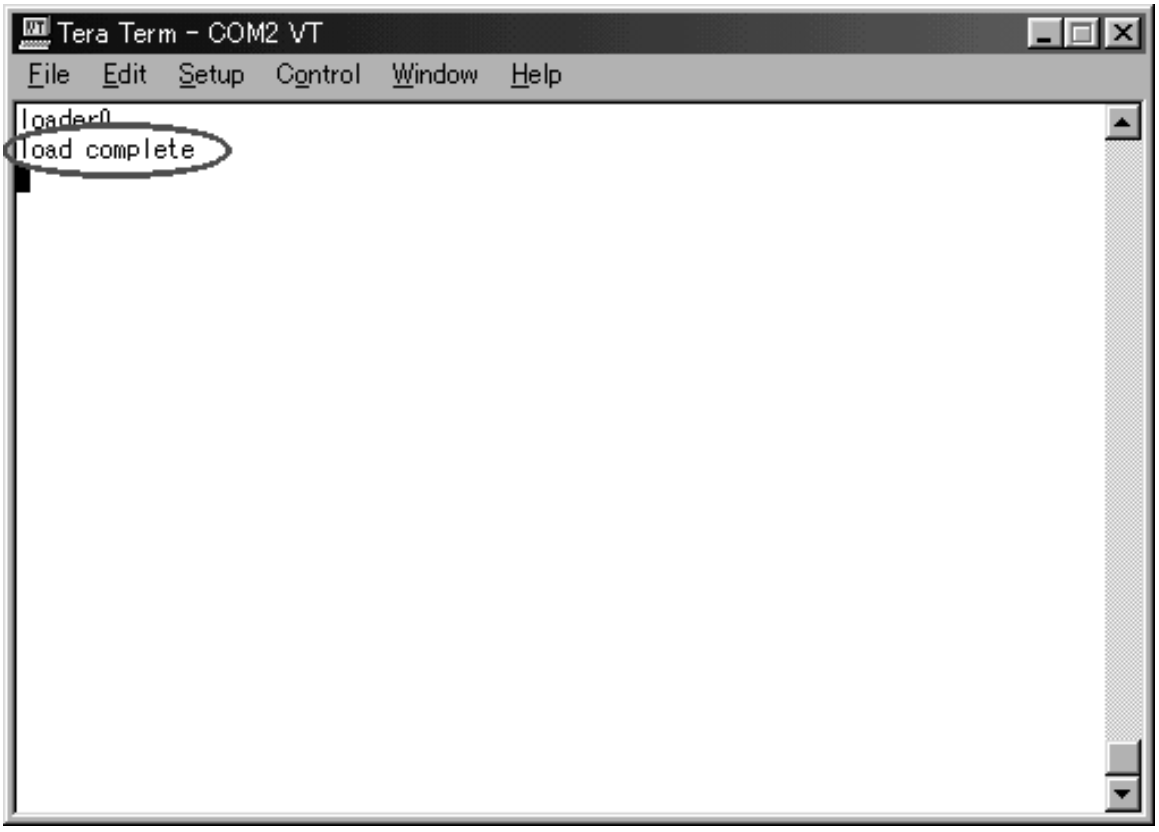
↓

Proceed to 7.

7.



If the description above appears, return to 4.



If the description above appears, downloading was completed normally.

↓

Proceed to 8.

8.

1. To go on to download FLASH ROM, perform the following procedures.
   1-1. Only perform procedures ① and ② described in Table 4.
   1-2. Return to 3.

2. To complete downloading FLASH ROM, perform the following procedures.
   2-1. Perform procedures ① through ③ described in Table 4.
   2-2. Terminate “Tera Term”.

Table 4. Termination procedures (1*)

	① Remove the connector from the Control PWB (CNPRG) of the FAX machine.	② Turn off the FAX machine.	③ Turn off the Program loader BOX.
FAX PWB rewriting	---	Turn off the FAX machine.	Set the switch of Program loader BOX as follows. (a) MAIN SW OFF (down)

1*. Perform procedures ① through ③ in numerical order.